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Yours truly
Dudley P. Allen

E. Allen

TRANSACTIONS

OF THE

FORTY-EIGHTH ANNUAL MEETING

OF THE

Ohio State Medical Society

HELD AT

PUT-IN-BAY,

JUNE 28, 29 AND 30, 1893.

Printed and published by order of the Society.

CINCINNATI, OHIO:
EARHART & RICHARDSON,
1893.

OFFICERS FOR 1893-94.

N. P. DANDRIDGE, M. D., Cincinnati, ... President.
F. C. LARIMORE, M. D., Mt. Vernon, ... 1st Vice-President.
WM. CALDWELL, M. D., Fremont, ... 2d Vice-President.
W. T. CORLETT, M. D., Cleveland, ... 3d Vice-President.
S. S. MCCURDY, M. D., Dennison, ... 4th Vice-President.
THOS. HUBBARD, M. D., Toledo, ... Secretary.
CHAS. GRAEFE, M. D., Sandusky, ... Assistant Secretary.
JAS. A. DUNCAN, M. D., Toledo, ... Treasurer and Librarian.

STANDING COMMITTEES.

FINANCE.

E. SINNETT, M. D., H. J. HERRICK, M. D.,
F. D. BAIN, M. D., R. B. HALL, M. D.
S. F. FORBES, M. D.

ETHICS.

W. J. SCOTT, M. D., AUGUST RHU, M. D.,
C. L. VANPELT, M. D., C. F. DUTTON, M. D.,
S. S. THORN, M. D.

PUBLICATION.

A. R. BAKER, M. D., J. F. BALDWIN, M. D.,
THOS. HUBBARD, M. D., W. J. CONKLIN, M. D.,
J. C. OLIVER, M. D.,
N. P. DANDRIDGE, M. D., *ex-officio.*

LEGISLATION.

J. H. LOWMAN, M. D., T. CLARK MILLER, M. D.,
X. C. SCOTT, M. D., S. S. THORN, M. D.,
W. A. DIXON, M. D.

ADMISSIONS.

D. J. MERRIMAN, M. D., A. F. HOUSE, M. D.,
A. R. BAKER, M. D., A. M. DUNCAN, M. D.,
O. T. MAYNARD, M. D.

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OHIO STATE MEDICAL SOCIETY.

At the Seventeenth Annual Meeting of the Ohio State Medical Society, the following resolution was adopted:

Resolved, That the publication of any address, prize essay, or other paper, by this Society, is no evidence of its endorsement of the sentiments therein contained.

FORTY-EIGHTH ANNUAL SESSION

OF THE

OHIO STATE MEDICAL SOCIETY

HELD AT

PUT-IN-BAY, JUNE 28, 29 AND 30, 1893.

HOTEL VICTORY,

PUT-IN-BAY, June 28, 1893.

The Forty-Eighth Annual Meeting of the Ohio State Medical Society was called to order by the President, Dr. Dudley P. Allen, at 2 P. M., and formally opened with prayer by the Rev. E. R. Horton.

Dr. John P. Sawyer then reported for the Committee of Arrangements.

On motion, by Dr. A. R. Baker, the business session, comprising the reports by the various committees, was postponed, and the scientific portion of the program was taken up. The Society then proceeded to scientific work.

Dr. Edward F. Cushing read a paper on "Infant Feeding." Discussion by Drs. C. F. Dutton, B. B. Loughead, H. J. Herrick, C. G. Comegys, H. A. Toby, and E. Sinnett.

The subject of "House Sanitation" was then discussed. The discussion was opened by Dr. H. J. Herrick, who was followed by Drs. Thos. Hubbard, John P. Sawyer, C. F. Dutton, and S. C. Ayres.

The subject of "Club Foot" was then taken up. Dr. W. E. Wirt opened the discussion of the "Initial Cases of

Club Foot." He was followed by Drs. Fann and L. Freeman.

On motion, the session adjourned until 7 P. M., Standard time.

WEDNESDAY, EVENING SESSION.

Meeting called to order at 7.30 P. M. Minutes of previous meeting read and approved.

Dr. Max Thorner read a paper on "Foreign Bodies in the Air Passages." Discussion by Drs. Dandridge, Fitzpatrick, Herrick, Maynard, and Hamilton.

Dr. Thos. Hubbard then read a paper on "Phlegmonous Pharyngitis." Discussion by Dr. Max Thorner and the author.

Dr. S. E. Allen, "Exudative Inflammation of the Middle Ear." Discussion by Drs. A. R. Baker, D. J. Merriman, Coleman, Gage, X. C. Scott, and the author.

Dr. W. T. Corlett read a paper on "Malignant Growths of the Skin, particularly of the Face—Their Early Recognition." Discussion, "Nevus Pigmentosus," Dr. R. C. Longfellow; "Epithelioma of the Lower Lip and Hands," Dr. D. J. Merriman; "Melano-sarcoma," Dr. F. W. Langdon.

Dr. N. Stone Scott then read a paper on "Rectal Stricture of Puerperal Origin."

Adjourned until 8.30 A. M., Standard time.

THURSDAY, MORNING SESSION.

The session was called to order by Dr. Allen, presiding. Minutes of previous meeting were read and approved.

Dr. N. P. Dandridge moved that all the business pertaining to this session be entrusted to an executive committee, consisting of five members. Carried. The President then appointed the following as members of said committee: Drs. N. P. Dandridge, Conklin, Sinnet, Collamore, and Case.

SECRETARY'S REPORT.

Under the present regime, it is very difficult to form an accurate estimate of the membership of the Ohio State Medical Society. If the estimate were based upon those who have paid their dues, the number would be 685, which would be a gain over last year of 257. If the estimation were based on the aggregation of the members of the various affiliated societies, nothing accurate could be obtained, as but few of the affiliated societies have sent in revised reports. Every medical society has its deaths and removals and new members, and without any knowledge of the number of these, nothing more than an approximation could be given, which would be about 1,500. This would include those who are active permanent members, but not members of any local society. During the year one new society has become affiliated with the State Society, viz.: the Cleveland Medical Society. The following is a complete list of affiliated local and district societies: Academy of Medicine, Cincinnati; Allen County, Ashtabula County, Belmont County, Brown County, Butler County, Champaign County, Central Ohio, Clermont County; Cleveland Medical Society, Cuyahoga County; Erie County, Fayette County, Greene County, Homestead Academy, Highland County; Lebanon, Mahoning County; Marion County, Miami Valley, Montgomery County; North Central, North Western, Piqua Medical Society, Portage County, Preble County, Shelby County, Summit County, Toledo, Tuscarawas County, Wayne County. The Academy of Medicine and Cincinnati Medical Society have fused into one society; also, the Bay City and Erie Medical Societies.

The present year has been an eventful one, fraught with unusual difficulties, the officers of the society having to execute the duties of their office under imperfected plans. The plan to have the local societies collect the dues and turn the same over to the State Society needs time for its completion. There were during the year several obstacles

in the way of its success. Many members of the profession are members of two or more local affiliated societies. Now, the question arose, must these members pay dues to the State Society in all the local societies of which they were members. This would be an injustice, and was met with strong opposition. In order to overcome this obstacle, a letter was sent, explaining the situation, to all the members of the State Society and local affiliated societies, to indicate to the Treasurer of the State Society in what local society they wished to be enrolled, so that the local societies could thereby be enabled to collect the dues from such members as justly owed their dues. Of 2,200 such notices sent out, about 100 answered. After waiting some time, this was again repeated, with no better results. An attempt had already been made to prepare the way for the amendment, by having the local societies vote their assent to the amendment, know as Article III, Section 10, to which process was given the name "Affiliation." Many of the members misunderstood this term, believing it to mean a friendly relation between the local and State Society, whereby the local society could send delegates to the State Society, and they would be cordially received.

The average attendance of the local societies is less than thirty per cent of the membership. Therefore, it is reasonable to suppose that most of the local societies that voted their assents to this amendment, did so by a very small per cent of their members. This is well sustained by the fact that most of the various societies, which had assented to the amendment, either entirely ignored their membership or positively refused to be considered members of the State Society. In fact, of all the local societies assenting to this amendment, only eight understood the amendment to mean that the local society became responsible for the payment of $1.00 to the Treasurer of the State Society for each of its members, or were willing to become responsible for this amount. The total membership of these eight societies is about 500, with an average attendance of about

150. There are, in the State of Ohio, something in excess of 3,000 regular physicians. As far as it is possible to obtain any knowledge of the membership of the various county societies in the State, 2,200 would be a very large estimate of the aggregate membership. Then, it is fair to suppose that but 150 physicians, certainly not more than 250, in the State of Ohio, are in favor of the innovation in the management of the State Society.

Without being able to form any conception of the number of Transactions that should be published, and without any money to publish them, after waiting upon the Treasurer to collect from the local societies the dues to the State Society, the Secretary undertook the publication of the Transactions under the most unfavorable circumstances in the history of the Ohio State Medical Society. The aggregate membership of the affiliated societies was probably 1,500. It seemed reasonable that two-thirds of this number might be willing to pay for their Transactions. So, 1,000 copies were ordered printed. The chief object in issuing the Transactions at all, under such circumstances, was the hope that those receiving them would see that the book was fully worth their dues. There was no money in the treasury to pay the postage on each individual book, which would have amounted to $130.00. The Secretary having already become personally responsible for the payment of the publication of the Transactions, did not feel justified in advancing $130.00. Therefore, where meetings were about to be held, the Transactions were directly expressed to the Secretary of the local society, with the request that the copies be delivered to the members present. In other instances they were expressed directly to the secretaries of the affiliated societies, with the hope that this would stimulate them to attempt to collect the dues. Another great obstacle arose. In the meantime a great many members had paid their dues direct to the State Treasurer. This caused great confusion in the local societies. For reasons best known to himself, the Treasurer could not furnish me

with a complete list of those who had paid, so that the secretaries of the local societies could be informed, but from his stub receipt books an imperfect conception of the number who had paid was obtained, and notices sent to the local secretaries. But again it was found that many, who had paid their dues and were active permanent members of the Ohio State Medical Society, did not belong to any local society, or not to any local society that was in affiliation with the State Society. This only added confusion to the efforts made to carry out the plan.

I think that the inactivity of the county societies is chargeable with the failure of the local societies to transmit the dues of their members. I made an attempt some time ago to obtain statistics from all the county societies in the State, some sixty in number. I succeeded in obtaining answers from twenty-nine. The twenty-nine represented a total membership of about 1,500, with a total average attendance of about 400. Of these twenty-nine societies, twenty-two had steadily lost in membership for the last five years. Why this state of lethargy or inactivity or lack of interest in the county societies? The fact was very prominent that the county societies, which are the least active, are located within the boundaries of flourishing district societies. Without hastening to condemn the district societies, for their success must be a prima facie evidence that they are supplying a real demand in medical society work, we must conclude that they are depriving the county societies, if not also the State Society, of the interest that should be taken by them.

The question came up all over the State, what benefit can our county society derive from becoming responsible to the State Society for the payment of the dues of our members. The only answer that could be given was, that it would manifestly increase interest in the State Society, enlarge its financial resources and improve the character of its Transactions. But this was not satisfactory. The only logical conclusion drawn by many physicians through-

out the State, who are members of local societies, was that the State Society had attempted, for its own benefit, to coerce the members of county medical societies into becoming members of the State Society, with no better purpose than to find a larger market for its Transactions.

After repeated correspondence with the secretaries of the affiliated societies, the following medical societies may be relied upon to become responsible for the payment of their dues to the State Society: Belmont County, Brown County, Cleveland Medical Society, Erie County, Fayette Medical Society, Hancock County, Shelby County and Toledo Medical Society. The other affiliated medical societies have either flatly refused to become responsible for the payment, or have entirely ignored the matter.

T. V. FITZPATRICK, M. D., *Secretary.*

TREASURER'S REPORT.

[As no report was received from the Treasurer, none appears in this volume.]

On motion, by Dr. X. C. Scott, the regular order of business was then taken up.

Dr. J. G. Kerr, of Canton, China, read a paper entitled "Native and Foreign Medicine in China." On motion, a vote of thanks was tendered Dr. Kerr for the paper.

Next followed a paper by Dr. N. P. Dandridge, on "Appendicitis." This was discussed by Dr. J. C. Oliver, Cincinnati. "The Relations of General Practitioners to the Treatment of Appendicitis," by Dr. C. D. Noble, Oberlin; "The Non-Surgical Treatment of Inflammations of the Right Iliac Fossa," Dr. F. D. Case, Ashtabula; also, by Drs. J. Hobson, of Flushing, and C. S. Hamilton, of Columbus. On motion, the discussion was then closed, and the next subject taken up.

Dr. Leonard Freeman, Cincinnati, who was on the program for a paper on the "Spirillum of Cholera," said he had only intended presenting a culture of the bacillus tuberculosis, but was unable to do so.

The subject of "Tuberculosis" was discussed by Dr. H. S. Straight, Cleveland, with reference to "Catarrhal Condition of Lungs Predisposing to Tuberculosis." Dr. Julius Wolfenstein, Cleveland, read a paper discussing "Paresthesia of the Larynx and Pharynx as a Premonitory Symptom of Pulmonary Tuberculosis."

On motion, the discussion was closed, and the next subject on the program taken up.

The subject of "Neuroses of the Heart" was then considered, and Dr. John H. Lowman read a paper on "Some Neuroses Found in Bright's Disease." Dr. Eichberg's discussion of "Neuroses of the Heart" was read by title, "Paroxysmal Tachycardia."

On motion, the discussion was closed, and the next subject taken up.

"Fracture of Lower Extremity of Radius." This subject was discussed by Drs. B. W. Holliday, Baldwin, Reeves, Geo. W. Crile, and Harmon.

The report of the Special Executive Committee was then presented by Dr. N. P. Dandridge, of Cincinnati, viz.:

Your Committee beg leave to report that, after a thorough examination of the facts, that they find that the Constitution and By-Laws, as they now appear in the transactions of last year, have never been adopted, and should not have been so printed.

2. That the Constitution of 1882 is still in force and legal.

3. That we recommend that the President appoint a committee of three on revision of the Constitution, who shall report on the first day of the next annual meeting.

That such revised report shall be printed and distributed to the members of the Society at least six weeks before the next annual meeting.

4. That members shall be admitted at this meeting on the recommendation of two members and the payment of the initiation fee and annual dues.

5. That the members of this Society shall be all the permanent members, and all members of affiliating societies who shall already have paid their annual dues. N. P. DANDRIDGE, *Chairman.*

Received and adopted.

Adjourned until 2 P. M.

THURSDAY, AFTERNOON SESSION.

Session called to order at 2 P. M. by the Chairman. The President then announced the following committees:

FINANCE COMMITTEE—Drs. E. Sinnett, F. D. Bain, H. J. Herrick, R. B. Hall, and S. F. Forbes.

COMMITTEE ON ETHICS—Drs. W. J. Scott, C. L. VanPelt, August Rhu, C. F. Dutton, and S. S. Thorn.

COMMITTEE ON PUBLICATION—Drs. A. R. Baker, Thomas Hubbard, J. F. Baldwin, J. C. Oliver, and W. J. Conklin.

COMMITTEE ON LEGISLATION—Drs. J. H. Lowman, X. C. Scott, T. Clark Miller, S. S. Thorn, and W. A. Dixon.

COMMITTEE ON ADMISSIONS—Drs. D. J. Merriman, A. R. Baker, A. F. House, A. M. Duncan (Bucyrus), and O. T. Maynard.

NOMINATING COMMITTEE—Drs. J. C. Reeve, Thomas Hubbard, Jas. T. Whittaker, F. D. Case, and F. C. Larimore.

COMMITTEE ON CONSTITUTION—Drs. N. P. Dandridge, Geo. A. Collamore, and W. J. Conklin.

A paper was then read by Dr. Thad. A. Reamy, Cincinnati, on "Unusual Experience in the Use of an Anesthetic During an Abdominal Section." This was discussed by Drs. W. H. Humiston, J. C. Reeves, and discussion closed by the author.

Dr. Leonard Freeman, Cincinnati, opened the subject of "Cholera" by presenting a culture of the spirillum of cholera. Then followed a paper on the "Etiology, Prevention, and Treatment of Cholera," by Dr. D. N. Kinsman, Columbus. The discussion was opened by Dr. G. A. Collamore, who spoke of the "Treatment by Restoration of Fluids." He was followed by Drs. S. D. Brooks, C. F. Dutton, C. G. Comegys, W. J. Scott, Worth, Baldwin, Herrick, and J. G. Kerr.

Dr. Jas. T. Whittaker, Cincinnati, then read a paper entitled "Palpitation of the Heart." Discussion by Dr. W. J. Scott.

Dr. Jos. Ransohoff, Cincinnati, presented a tumor which he removed from a man's brain, with a microscopical specimen of the same.

The session adjourned to meet at 7.30 P. M.

THURSDAY, EVENING SESSION.

On motion, the report of the Committee on Admissions was received and adopted.

Dr. J. W. Scott reported for the Committee on Ethics that they had nothing to report.

Dr. Herrick reported for the Committee on Finance. A motion to receive was superseded by one to recommit the same to the Committee, to report Friday morning.

Election of officers followed, which resulted in the acceptance and confirmation of the report of the Nominating Committee, and the following were declared the officers of the Society:

President—N. P. Dandridge, Cincinnati.
First Vice-President—F. C. Larimore, Mt. Vernon.
Second Vice-President—William Caldwell, Fremont.
Third Vice-President—W. T. Corlett, Cleveland.
Fourth Vice-President—S. S. McCurdy, Dennison.
Secretary—Thomas Hubbard,* Toledo.
Assistant Secretary—Chas. Graefe, Sandusky.
Treasurer—J. A. Duncan, Toledo.
Member Finance Committee—E. P. Fullerton, Columbus.
Member Committee on Ethics—J. H. Lowman, Cleveland.
Member Committee on Publication—J. C. Oliver, Cincinnati.
Member Committee on Legislation—J. F. Baldwin, Columbus.
Member Committee on Admissions—C. D. Noble, Oberlin.

*Dr. John P. Sawyer, Cleveland, was elected Secretary, but afterward resigned.

Zanesville was selected as the next place of meeting, and the time, third Wednesday in June.

Then followed the President's address.

It was "*Resolved*, That the Secretary be instructed to publish in the Transactions a separate list of the members and delegates in attendance on each annual meeting." Carried. Adjourned.

FRIDAY, MORNING SESSION.

The meeting was called to order, Dr. Dudley P. Allen in the chair.

The minutes of Thursday morning and afternoon sessions were read and approved.

Announcements by the Committee of Arrangements.

Dr. John P. Sawyer, Cleveland, then declined the position of Secretary. Dr. Baker moved to accept the resignation, and that the matter be referred back to the Nominating Committee. Carried. The Committee on Nominations then reported the name of Dr. Thomas Hubbard to fill the vacancy. Accepted and adopted.

The following report of the Committee of Publication was received and filed:

Committee met at Cincinnati, and elected Dr. T. V. Fitzpatrick editor. Bids were received as follows on one thousand copies of 350 pages:

Western Methodist Book Concern,.....		$550 00
Additional pages,.....	$1 15	
C. J. Krehbiel & Co.,.....		551 00
Additional pages,.....	1 55	
Geo. P. Houston,.....		550 00
Additional pages,.....	1 85	
Lancet-Clinic,.....		540 00
Additional pages,.....	85	

Publication delayed on account of estimating number of copies to be distributed. Contracts were awarded in December; transactions were not delivered until April. Editor was not responsible for this delay.

A. R. BAKER, *Chairman.*

The following report of the Committee on Finance was received and filed:

WHEREAS, A deficiency of $747.50 has unavoidably occurred on account of the previously-proposed change in the Constitution, which proposed change has been rescinded by your action of yesterday, also,

WHEREAS, The expenses of the ensuing year will amount approximately to about $845, as made by estimates, together amounting to $1,492.50, your Committee recommend that, in addition to the annual dues of $1, the sum of $1 be assessed upon the members, in order to meet the immediate needs of the Society, and partly cover deficiencies. It is hoped that delinquent dues may be collected so as further to reduce the indebtedness during the year.

It is further advised that the matter of salaries to Secretary and Treasurer revert back to the provisions of the old Constitution.

We further recommend that, hereafter the Secretary and Treasurer shall report in detail all the operations of their respective offices (with vouchers), on the first day of each session, which reports shall be referred to the Finance Committee at once, which shall examine and report back the same with their recommendations on the second day of the session.

H. J. HERRICK, *Chairman.*

Dr. Oliver reported unless the money was forthcoming there would be no transactions published this year, unless his resignation was accepted. The following gentlemen then signified their willingness to be responsible for the payment of the money, should the Society be unable to raise it: Drs. Dudley P. Allen, W. J. Conklin, N. P. Dandridge, T. V. Fitzpatrick, H. J. Herrick, W. H. Humiston, J. C. Oliver, Jos. Ransohoff, and X. C. Scott.

Dr. C. G. Comegys moved to adjourn at 1 o'clock to the dining room, where an informal dinner should be held.

The scientific business was then taken up.

A paper on "Empyema" was read by Dr. Jos. Ransohoff, of Cincinnati, with the following discussion: "Some Points in the Diagnosis of Chest Effusions," L. F. Forbes; "Diagnosis of Empyema," Thos. M. Sabin; "Relative Merits of Aspiration and Resection in Chronic Cases," J.

C. Martin; "Complications in Empyema," Wm. Caldwell. Drs. J. H. Lowman, S. S. Thorn, Coleman, and Baldwin participated in the discussion.

Dr. Merriman reported for the Committee on Admissions that the following names had been acted upon favorably: Drs. Everett, Kepton, Ohio; T. W. Sabin, Trumbull County Medical Society; T. Clark Miller, Stark County Medical Society; J. F. Haynes, Northwestern Ohio Society; J. M. Fassig, Zanesville, Ohio; Dr. Davidson, N. Amherst, Ohio; Chas. A. Hatch, Newark; C. L. Dim, Minister, Ohio; C. D. Noble, Oberlin, O.

The following County Society was accepted as an auxiliary society: Crawford County Medical Society.

"Penetrating Wounds of the Eyeball," was the title of a paper read by Dr. S. C. Ayres. "The Use of the Electro-Magnet in Removing Foreign Bodies From the Eye," Dr. A. R. Baker. "Treatment," Dr. B. L. Millikin.

Dr. Baldwin then moved, that "the future Committee of Arrangements be requested to dispense with the expense of a stenographer." Seconded and carried.

Dr. Baldwin then read the following resolution:

WHEREAS, Many of the papers presented at this meeting cover points in common, and their publication in full in the volume of transactions would be manifestly unnecessary and unwise, therefore,

Resolved, That the editor and President be given full authority, and are hereby instructed to exercise the same, to eliminate such unnecessary and superfluous matter, indicating by asterisks the elimination.

"Amputation of the Leg Below the Knee," by Dr. A. Rhu, was read by title. The subject was discussed by Drs. F. C. Larimore, S. S. Thorn, and D. J. Merriman.

Dr. J. F. Baldwin then read a paper, "Methods of Performing Symphysiotomy." Discussed by Dr. Frank S. Clark, "Pelvic Contractions Indicating Symphysiotomy;"

Dr. W. H. Humiston, "Indications for Operation," and Dr. Rufus B. Hall, "Operative Treatment."

The following resolution was offered by Dr. W. J. Scott, and adopted:

Resolved, That it is the sense of this Society, that under the present law for the organization of the health department of this State, it is the duty of the State Board of Health to urge the complete organization of municipal, county and township Boards of Health, so that they may act with the State Board, giving a complete, accurate registration of the vital statistics of the State.

LIST OF MEMBERS PRESENT.

Allen, Dudley,.....Oberlin.
Allen, Dudley P.,.....Cleveland.
Allen, S. E.,.....Cincinnati.
Bain, F. D.,.....Kenton.
Baldwin, J. F.,.....Columbus.
Baker, A. R.,.....Cleveland.
Baker, J. P.,.....Findlay.
Barnes, W. T.,.....Fredericksburg.
Beachy, N. C.,.....New Philadelphia.
Beeman, P.,.....Sidney.
Benny, C. T.,.....Tiffin.
Bond, J. W.,.....Toledo.
Barntles, G. W.,.....Lancaster.
Bowman, J. H.,.....Vickery.
Bricker, W. N.,.....Shelby.
Brigham, O. S.,.....Toledo.
Brooks, S. D.,.....Cleveland.
Bunce, W. C.,.....Oberlin.
Burns, T. R.,.....Indianapolis.
Burt, F.,.....Norwalk.
Butler, G. W.,.....Columbus.
Caldwell, Wm.,.....Fremont.
Case, F. D.,.....Ashtabula.
Clark, F. R.,.....Cleveland.
Clark, F. S.,.....Cleveland.
Cleaver, J. V.,.....Akron.
Coleman, N. R.,.....Columbus.
Collamore, G. A.,.....Toledo.
Comegys, C. G.,.....Cincinnati.
Corlett, W. T.,.....Cleveland.
Conklin, W. J.,.....Dayton.
Crane, A. M.,.....Marion.
Crile, G. W.,.....Cleveland.
Cullen, G. I.,.....Cincinnati.
Cum, Eli,.....Akron.

Cushing, E. F.,.....Cleveland.
Dandridge, N. P.,.....Cincinnati.
Devilbiss, A.,.....Toledo.
Dine, C. L.,.....Minster.
Dixon, W. C.,.....Ripley.
Duncan, A. M.,.....Columbus.
Duncan, J. A.,.....Toledo.
Dunlap, C. O.,.....Athens.
Dutton, C. F.,.....Cleveland.
Everett, A. B.,.....Kipton.
Fann, G. C.,.....Kelly's Island.
Fassig, J. M.,.....Zanesville.
Fern, E. L.,.....Sidney.
Fitzpatrick, T. V.,.....Cincinnati.
Forbes, S. F.,.....Toledo.
Freeman, L.,.....Cincinnati.
Gibson, H. B.,.....Tiffin.
Gillett, W. J.,.....Toledo.
Gilliam, D. T.,.....Columbus.
Grosch, L. C.,.....Toledo.
Guerin, L. T.,.....Columbus.
Hall, R. B.,.....Cincinnati.
Hamilton, C. S.,.....Columbus.
Hamilton, J. W.,.....Columbus.
Harmon, J.,.....Marion.
Hatch, C. A.,.....
Haynes, J. T.,.....Sandusky.
Heard, E. N.,.....Sandusky.
Heath, F. M.,.....White House.
Heims, J. H.,.....Van Wert.
Herrick, H. J.,.....Cleveland.
Hobson, J. A.,.....Flushing.
Holce, C. D.,.....Oberlin.
Holliday, B. W.,.....Cleveland.
House, A. F.,.....Cleveland.
Howell, J. M.,.....Washington C. H.
Hubbard, Thos.,.....Toledo.
Hughes, F. M.,.....Vermilion.
Humiston, W. H.,.....Cleveland.
Hyatt, E. S.,.....Delaware.
Jones, F. W.,.....Columbus.
Knapp, G. L.,.....Canton.
Langdon, F. W.,.....Cincinnati.

Larimore, F. C.,.....Mt. Vernon.
Lawrence, F. F.,.....Columbus.
Lowman, J. H.,.....Cleveland.
Longfellow, R. C.,.....Cincinnati.
Loughead, B. B.,.....Akron.
Martin, Jas,.....Fredricksburg.
Martin, J. C.,.....Findlay.
Maynard, O. T.,.....Elyria.
Merriman, D. J.,.....Painesville.
Merz, C. H.,.....Sandusky.
Miller, F. C.,.....Massillon.
Milliken, B. S.,.....Cleveland.
Morse, C. S.,.....Newark.
North, John,.....Toledo.
Oliver, J. C.,.....Cincinnati.
Osborn, A. L.,.....Norwalk.
Perkins, C. E.,.....Sandusky.
Quirk, H. W.,.....Cleveland.
Ransohoff, J.,.....Cincinnati.
Reamy, T. A.,.....Cincinnati.
Reeve, J. C.,.....Dayton.
Rhu, A.,.....Marion.
Root, H. A.,.....Toledo.
Rosenwasser, M.,.....Cleveland.
Sabin, T. M.,.....Warren.
Sawyer, J. P.,.....Cleveland.
Scott, W. S.,.....Cleveland.
Scott, W. J.,.....Cleveland.
Scott, X. C.,.....Cleveland.
Sears, J. M.,.....Put-in-Bay.
Shackleton, W. S.,.....Cleveland.
Sinnett, E.,.....Granville.
Smith, J. M.,.....New Philadelphia.
Stamm, M.,.....Fremont.
Straight, H.,.....Cleveland.
Storey, Wm.,.....Castalia.
Thompson, W. E.,.....St. Clairsville.
Thompson, W. P.,.....New Philadelphia.
Thorn, S. S.,.....Toledo.
Thorner, Max,.....Cincinnati.
Tobey, H. A.,.....Toledo.
Van Pelt, C. L.,.....Toledo.
Walker, A. B.,.....Canton.

Webb, F. C.,.....Cleveland.
Werner, R. J.,.....Toledo.
Willard, G. P.,.....Tiffin.
Williams, J. L.,.....Delaware.
Wirt, Wm. E.,.....Cleveland.
Wirth, R.,.....Columbus.
Whittaker, J. T.,.....Cincinnati.
Wolfenstein, J.,.....Cleveland.
Zopf, W. J.,.....Findlay.

The Society also had the pleasure of entertaining as the guest of honor J. G. Kerr, M. D., of Canton, China.

DUDLEY P. ALLEN.

Dudley P. Allen was born in Kinsman, Trumbull County, Ohio, in March, 1852. He graduated from Oberlin College in 1875, and from Harvard Medical College in 1879.

After serving as House Surgeon in the Massachusetts General Hospital, he went abroad, spending between two and three years in professional study in the leading medical centers. On his return, after a time spent in New York and Philadelphia, he settled in Cleveland in 1883.

His practice was always largely surgical, and has been exclusively confined to that branch since 1887.

He is now Visiting Surgeon to Lakeside Hospital and Charity Hospital, and Professor of Surgery in the Medical Department of Western Reserve University.

ADDRESS OF PRESIDENT.

HISTORY OF EARLY LEGISLATION AND SOCIETIES IN OHIO.

By Dudley P. Allen, M. D., Cleveland.

Some years ago, at the request of a number of the older physicians, in the vicinity of Cleveland, I prepared a series of articles upon the early medical history of Ohio. When collecting material for these articles, I also gathered certain facts relating to the formation of the early State Medical Societies.

In considering a subject for my paper to-day, and in looking over the addresses which have been delivered by previous Presidents, I felt that so much had been said with reference to the conduct of the Society, and so much advice had been given relative to the method of conducting these meetings, that nothing further in this direction would be in place.

It seemed to me, that a brief history of the early State Societies, together with their formation, might be of interest to this body, and if placed in our published transactions, might be of value as a matter of record.

I might here state that a considerable history of early medical matters may be found in an address of Dr. Peter Allen, President of the Society, published in the Transactions of 1857, and in a paper read before the society in 1870, by Dr. Edward B. Stevens.

So far as I can find, the first State Society was the result of an act passed at the first session of the Ninth General Assembly of Ohio, at Zanesville, January 14, 1811. The act is to be found in the Laws of Ohio, Volume IX, page

19. The following is not a complete extract, but is, perhaps, as much as will be of interest to this Society:

WHEREAS, The practice of physic and surgery is a science so immediately interesting to society, that every encouragement to its promotion should be given, and every abuse of it, so far as possible, should be suppressed. Therefore:

SECTION 1. Be it enacted by the General Assembly of the State of Ohio, that this State be, and is hereby, divided into five medical districts, and each district is to contain three medical censors, or examiners, to be appointed by the General Assembly of the State of Ohio, who shall hold their appointments during good behavior, or until such time as a medical society shall be incorporated in this State.

SEC. 2. Examiners named in the section were duly constituted a medical board, for the purpose of examining candidates for the practice of physic and surgery, or midwifery, in the manner hereafter specified, in the several districts, to which their names were attached.

SEC. 3. Persons desiring to practice medicine were obliged to obtain licenses from these censors.

SEC. 4. No person could receive a certificate who had not studied three or four years under some able physician or surgeon, or could present a certificate from some medical society, showing his knowledge of anatomy, surgery, materia medica, chemistry, and theory and practice of physic.

SEC. 6. Persons who were not possessed of a proper certificate from the censors, and who should, except in cases of urgent necessity, act in the capacity of a physician should not have the assistance of law in collecting bills.

SEC. 8. The censors were to meet on the first Monday of June, and first Monday of November, to grant licenses. Each license was to be $5.

In the general laws of Ohio, for 1812, Volume X, page 58, is the following, enacted February 8:

An act to incorporate medical societies.

WHEREAS, Well-regulated medical societies have been found useful in promoting the health and happiness of so-

ciety, by more generally diffusing the knowledge of the healing art, and thereby alleviating the distress of mankind. Therefore:

SECTION 1. Be it enacted by the General Assembly of the State of Ohio, that there be a Medical Society formed within this State, to consist of the following persons (who are named), and from other physicians who shall produce a diploma or credentials, or any who may be hereafter approved of and admitted from time to time, as is hereinafter provided. The Society, when organized, as is hereafter directed, shall be called by the name of the President and Fellows of the Medical Society of the State of Ohio.

ACT 2. Be it further enacted, that this State be, and hereby is, divided into seven medical districts.

The districts are then named ——.

SEC. 4. Each district shall determine qualifications for admission to membership.

SEC. 5. Each society was to send delegates to Chillicothe the following November, to choose officers and make regulations governing the Society. They were not, however, to regulate prices. They were to appoint examining committees in the various districts, to examine candidates for the Society, and grant them diplomas. They could also confer honorary degrees.

SEC. 6. They were to communicate to the Society interesting cases, conditions of climate and atmosphere, and the occurrence of any epidemic.

SEC. 8. The Society might make such assessments as it saw fit, but not to exceed $2, and collect such by duly authorized process of law, said assessment to be for the benefit of the Society.

SEC. 9. All persons licensed to practice medicine were assessed $5.

SEC. 10. Any person not licensed by some society or medical college could not collect fees by process of law, and was subject to a fine of not more than $100, nor less than $50, for every such offense, one half to be paid to person suing for the same, and the other half to the medical society of the district in which offense was committed.

In the State Society Report, 1870, page 96, I find the following: "Dr. Drake tells us he made at that time a Winter

visit to Chillicothe, to attend the first State Convention provided for by the above law. Five delegates were present."

I have taken the trouble to follow the laws enacted subsequent to this period, and I have made a short recapitulation of them.

LAWS OF OHIO, VOLUME XI, PAGE 22.

ENACTED JANUARY 14, 1813.

SECTION 1. The districts were increased from six to seven. Each district was to have seven censors, appointed by the General Assembly, to hold office during good behavior, or until successors were appointed.

SEC. 6. Persons violating the law, requiring licenses, should forfeit and pay not more than $70 nor less than $5 for each offense.

SEC. 8. The censors were to meet twice each year.

SEC. 9. Three censors should perform the duties enjoined by this act, and for each license granted they were to receive $5 from the applicant to defray the expenses of their office.

SEC. 11. That it shall be the duty of the Medical Boards as aforesaid, to communicate at their respective meetings such facts, observations, discoveries, and speculations in medicine and the auxiliary branches of science and literature, as they may be able. Those parts of which, that may be deemed proper, shall be published by the several boards.

SEC. 13. The enactment of February 8, 1812, was repealed.

LAWS OF OHIO, VOLUME XV, PAGE 195.

ENACTED JANUARY 28, 1817.

SECTION 1. The medical districts were increased to eight.

SEC. 8. In addition to the signature of the President of the Board of Censors, each certificate was to be signed by the President of the Court of Common Pleas.

SEC. 9. Any person practicing contrary to law could, on conviction, be fined not to exceed $200; said fine to be paid

to the County Treasurer, for county purposes. Said persons should collect no bills by process of law.

Former enactments, January 14, 1813, were repealed.

LAWS OF OHIO, VOLUME XVI, PAGE 105.

ENACTED JANUARY 30, 1818.

SECTION 1. Any person having secured the degree of Doctor of Medicine in any university or other medical institution, within the United States, and wishing to practice in this State, shall, on application, be entitled to a license free, from any of the Board of Censors, without examination or paying fee required.

LAWS OF OHIO, VOLUME XVII, PAGE 37.

ENACTED JANUARY 19, 1819.

WHEREAS, Society at large is deeply interested in the promotion of medical and surgical knowledge, and,

WHEREAS, The students of medicine in the State of Ohio are so distant from any well-regulated college as to labor under serious disadvantage in the prosecution of their studies. Therefore:

SEC. 1. Be it enacted, that there shall be established in Cincinnati, a college for instruction in physic, surgery, etc., under the title "The Medical College of Ohio."

SEC. 6. Said college was empowered to grant the degree of Doctor of Medicine.

SEC. 8. The following professors were appointed: Daniel Drake, Professor of Institutes, and Practice of Medicine; Samuel Brown, Professor of Anatomy; Coleman Rodgers, Professor of Surgery; E. Slack, Professor of Chemistry and Pharmacy.

LAWS OF OHIO, VOLUME XIX, PAGE 28.

ENACTED JANUARY 15, 1821.

There shall be as many medical districts as circuits of the Court of Common Pleas.

SECTION 5. The censors were to meet each year in Columbus. The body thus assembled was to be called the Medical Convention of Ohio. This body was to have the exclusive power to grant licenses to candidates for the practic of physic and surgery, prescribe periods and methods of study, and the qualifications of candidates, but the period of study was not to be less than two nor more than four years. The rules established by the Convention were to govern the censors in the various districts. The regulations passed concerning permission to practice medicine were not, however, to apply to graduates of regular schools of medicine.

No rules concerning charges were to be made.

SEC. 6. The censors of a district could issue licenses to practice, but these must be confirmed by the next meeting of the Medical Convention of Ohio.

SEC. 8. Persons practicing without license could not have the aid of the law in collecting bills, nor could they be appointed censors.

SEC. 10. Persons obtaining permits from Boards of Censors were to pay $1 to the clerk of said Board. Graduates of medical schools were to pay a like sum. The clerk of Board, after paying necessary expenses, was to send the remainder to the treasurer of the Medical Convention of Ohio. For every license granted, $10 was to be paid to the treasurer of the Convention.

SEC. 22. Censors living at a distance from place of meeting of Board were to receive $2 per day for attendance upon meetings of said Board. Delegates to the Convention were to receive similar compensation, both to be paid out of the treasury of the Convention.

SEC. 14. Three censors were to be retired, and three new ones elected annually.

SEC. 16. The Medical Convention of Ohio was to elect annually two men from its body to serve as censors at the commencement of the Medical College of Ohio.

The Convention could select annually two students, who were to be instructed gratuitously.

SEC. 21. All previous enactments concerning the practice of physic and surgery were repealed.

LAWS OF OHIO, VOLUME XXII, PAGE 142.

ENACTED FEBRUARY 26, 1824.

SECTION 1. The State was divided into twenty medical districts, which are named ——.

SEC. 5. Censors should serve as an Examining Board. This Board might grant licenses to those who had studied not less than three years, who could pass a satisfactory examination.

Persons, however, who had secured a collegiate education were only required to study two years.

SEC. 10. A copy of all licenses to practice medicine was to be deposited with the clerk of the Court of Common Pleas.

SEC. 11. Persons not properly licensed could not collect bills for medical services by law, and for each violation of law requiring license could be fined $10 and costs, on conviction before a Justice of Peace, said moneys to go to the support of the poor of the township.

This regulation was not, however, to apply to men summoned from other States for medical services.

SEC. 12. No regulations concerning fees were to be made.

SEC. 14. Delegates should be elected to a convention to meet at Columbus on the second Monday of December, 1827, for the purpose of forming a general medical convention of the societies of the State, should this be deemed advisable.

SEC. 16. The general medical society of the State, when formed, should be a corporate body, self-perpetuating, and should have a visatorial power over all district medical societies in the State, having power to regulate such societies.

SEC. 17. The enactments of January 15, 1821, were repealed.

The following was enacted February 7, 1825:

SECTION 1. Be it enacted, that every attorney and every physician and surgeon shall pay into the treasury of the county in which he resides such a sum as shall be determined by the Court of Common Pleas of said county. Said tax to go to State Treasurer for State purposes.

In the *Western Medical Journal*, of 1827 and 1828, page 598, I find the following: "The first State Medical Convention of Ohio was held December 10, 1827. Out of twenty-two districts, twenty delegates assembled."

This Convention resolved to form a State Society. It decided upon two classes of members, representative and honorary. The former to be chosen one from each district, and the honorary members to be elected by the Society.

The first meeting was to be held in January, 1829, and to be held annually thereafter.

I think, however, that this effort to form a State Society was not successful. I find reference made to this in the address of Peter Allen, President of the State Society, in 1857. On page 34, he says: "Before speaking of our State Medical Society, I must refer you back to the year 1827, when our State Legislature passed a law authorizing a convention of delegates to meet in Columbus, to form a constitution for the State Medical Society. A constitution was formed from a model of a society then existing in the State of Massachusetts. The Society was to meet tri-annually at Columbus, and have supervision over district societies. The law regulating the practice of physic and surgery was soon after repealed, and our former efforts for an organization proved abortive."

To attend this meeting, Dr. Allen relates that a week was necessary for the journey, on horse-back, to Columbus, the mud being very deep; one week was occupied by the meeting, and a third week by the return journey. He says that horse and rider looked as though both had just been pulled out of the mud of a canal.

From this, I judge that the primary idea of a State Medical Society was, that it was to be composed primarily of

delegates from district societies, and its chief function was to regulate the practice of medicine, and to have supervision over the district societies.

February 22, 1830, the following was enacted:

SECTION 2. The auditor and commissioners of various counties were to estimate the annual income of practicing lawyers, and physicians, and to charge a tax upon each according to his income, said tax not to exceed $5.

Previous law, enacted February 7, 1825, repealed.

February 19, 1833, an act was passed to incorporate the Cincinnati Medical Society.

February 22, 1833, an act was passed to incorporate the Ohio Medical Lyceum in City of Cincinnati.

An act passed February 27, 1834:

SECTION 1. Any physician, or other person, inducing an abortion. except to preserve the life of the woman, or by the advice of two physicians, shall, on conviction, be imprisoned in the county jail not more than one year, and fined not more than $500.

SEC. 2. Any one inducing an abortion on a woman with a quick child, except under foregoing precautions, shall. be imprisoned in the penitentiary not more than seven years, nor less than one year.

SEC. 3. Any physician who, when intoxicated, shall prescribe dangerous medicines, endangering the life of the patient, shall be liable to a fine of not more than $100.

SEC. 4. Any physician, or other person, prescribing a secret remedy, thereby endangering the life of a patient, shall be fined any sum not exceeding $100.

In June, 1834, the following circular, addressed to all scientific practitioners of medicine and surgery in the State of Ohio, was published by William M. Awl, of Columbus.

The circular reads as follows:

"The undersigned, uniting in sentiment and feeling with that portion of the profession who view with pain

the great depression of character, want of harmony, and concentration of useful action, which unhappily prevail in medical science, acknowledging also proper responsibility for the advancement of correct principles, promoting public benevolence, and the common welfare of society, are induced most respectfully to recommend and consent to support a call for the assembling of a General Medical Convention, to be holden in the city of Columbus, on Monday, the 5th of January, 1835.

"The grand design is to organize, for practical utility, the whole scientific medical power of the State. All regular scientific practitioners of medicine or surgery, either of city, village, or country, who are disposed to advance the honor and dignity of the profession, who have a heart in the cause of science, and are ready to unite with the great and good of the age in elevating the moral and scientific character and talent of the great and extending West, are cordially invited and expected to come and record their names in this convention.

"The regulation of professional etiquette, the construction of independent medical societies, the support of a periodical journal of practical medicine, the erection and location of public asylums for the reception of lunatics, and the instruction of the blind, the promotion of the temperance cause, the regulation of vaccination, and many other subjects will, perhaps, claim the attention of the convention. But the whole proceeding should be an independent and voluntary offering for the common good, and all are expected to come unpledged, and none should come entirely unprepared."

The Society was organized with the following officers: President, Peter Allen; Corresponding Secretary, Wm. L. Awl; Recording Secretary, M. Z. Creider; Treasurer, M. B. Wright.

The principal objects of the Convention were, to "petition the Legislature for the establishment of a Hospital for the Insane, for a School for the Blind, and to petition Congress to establish Marine Hospitals along our western waters." The Deaf and Dumb Asylum was then in existence.

The Legislature, then in session, "cordially co-operated

with the Convention in laying the foundation for our benevolent institutions."

Among other resolutions, one was presented by Dr. Drake, relative to the establishment of commercial hospitals along the internal water-ways. In his report, he says: "The ascending steamboat voyage every year brings up the Mississippi and its tributaries, a great number of deck passengers, chiefly sons of farmers, of whom many die on board, but the number that perish in the long and sickly descending voyage of the flat-bottomed boats, which often depart from the upper waters in Summer and early Autumn, when they are low and their shores unhealthy, must be still greater. Nothing is more common than for two, out of the five hands who generally manage one of these boats, to die, and it has even happened that the whole have perished, and the boat and its cargo has been left deserted, to be lost."

Dr. Drake presents a long paper, showing the necessity for these hospitals along our lakes and rivers, and advocates the necessity of the general government erecting and conducting them, since the responsibility seemed not to be so much State as National.

I find that the expense to each member, accruing from the cost of this Convention, in 1835, was $1.50.

I find, also, on page 27 of the proceedings of the Convention, the following resolution, viz.: "That the digested code of medical ethics published in the proceedings of the General Medical Society, of the year 1831, be published in the proceedings of the Convention," by which it becomes evident that there must have been a meeting of some sort in 1831.

I have not been able to find much concerning the district or county medical societies, except that they met to discuss medical subjects, and grant licenses to practice medicine.

Dr. B. B. Loughead, of Akron, when Secretary of the Portage County Medical Society, wrote me that he had a

copper medallion, presented to the Society by Dr. DeWolf. This was the size of a silver dollar, bearing the figure of a man, with a long cloak and hat, holding in one hand an herb, and in the other a cane. Under the figure are the words, "*Dum Vita Spes*," and around the figure, "XVIII Medical District of Ohio."

Dr. A. N. Reed, of Norwalk, sent me a clipping of a paper, yellow with age, which he says must be over fifty years old, and which reads as follows: "The annual meeting of the Fourteenth District Medical Society was held in Norwalk on the 25th of May. The following officers were elected ——." (I omit the names.)

The following resolutions were unanimously adopted:

Resolved, That the members of this Socity view with approbation the efforts which are now making for the suppression of intemperance.

Resolved, That we will, as physicians, use our influence and exertions in favor of total disuse of distilled spirits, except as medicine.

Strangely enough, I find upon the back of same newspaper clipping an advertisement for a patent medicine, which is guaranteed to be a gentle purgative and cure for female complaints, and also for rheumatism, gout, dyspepsia, blood, liver, and, in fact, almost all the ills to which flesh is heir.

The Convention of 1835 adjourned to meet in Columbus, January 1, 1838. Samuel Hildreth, of Marietta, was elected President. The meeting was evidently full of interest. In his valedictory address, delivered at this meeting, Dr. Peter Allen says:

"I came to this country when a young man; it was then one wide-spread wilderness, with here and there a scattered settlement, which might well have been compared with dots on a map of the country. The Indians still lingered on the hunting grounds of their fathers, and roamed our plains in the chase. But they are gone. The physician of that day had to traverse the wilderness, to cross streams

and swamps, without roads, and without bridges, trusting to the sagacity of his horse; he must thread the mazes of the forest in midnight darkness, or, guided by the polar star, happy if he could reach the humble cabin of the hunter and partake of his coarse but hospitable fare. In the early times to which I have alluded, medicine books could scarcely be obtained on this side of the mountains. We now have works written by our own citizens, which equal in merit many of those of other countries. The medical schools of the East were few and beyond the réach of the indigent pupil; we now have respectable institutions of our own, which render a good medical education of easy attainment to the industrious and persevering student."

One of the most interesting papers presented at this session was a report upon French surgery, by Dr. Willard Parker, then of Cincinnati, and later of New York. The pictures of the state of surgery in French hospitals, as viewed from the standpoint of the recovery of patients, is lamentable.

March 7, 1838, an act was passed by the State Legislature appropriating $1,500 to liquidate any unsatisfied claims against the Medical College of Ohio. Any balance remaining was to be used in purchasing books and apparatus.

The next meeting of the Convention was held in Cleveland, on the second Tuesday of May, 1839. The retiring President, Dr. Hildreth, presented a medical address which, I think, is one of the most remarkable papers I have ever read, when we consider the circumstances under which it was written.

Dr. Hildreth, living in Marietta, occupied with general practice, wrote a paper, treating first: of Topography, and the Primitive Aspect of the Country on the Ohio River; second, Climate, and its Changes from the Effect of Cultivation; third, Diseases of the Aborigines; fourth, Diseases of the First White Settlers, and Early Epidemics; fifth, Treatment of Diseases Thirty Years Since; sixth, Recent Epidemics; seventh, Diseases Common to this Climate,

with the Modifications which have taken Place from the Changes of Diet, Fashion, Habits, etc.; eighth, Closing Remarks on the Privations and Pleasures of Physicians. In this paper, thirty pages in length, Dr. Hildreth shows an amount of personal study and observation which demonstrate him a man of superior ability.

After citing all the opportunities for study and investigation of botany, geology, conchology, astronomy and kindred sciences, in long rides of the physician by day and by night, during Summer and Winter, he says of the remuneration of practice: "But above all, the pleasing thought that he has been the blessed means of rescuing a father, mother, or child of some distressed family from the grasp of death, must ever remain his richest compensation, to be prized far above gold, however necessary it may be to our wants, and is his best, if not often his only reward for many a long and weary ride, and many a sleepless night."

At the meeting of 1839, a committee, consisting of Peter Allen, R. L. Howard and Perkins Wallace, reported the following resolution, which was adopted by the society:

Resolved, That a medical society be formed in each county of the State; that the first meeting be held on the last Tuesday of October next and then semi-annually, and that the subject of a State Society be referred to their consideration.

SECTION 1; March 9, 1840. The State Legislature enacted that, if a judgment was secured against a doctor engaged in practice, he was entitled to select one horse or mare, one saddle and bridle, also medicines, instruments and books pertaining to his profession, not exceeding in value $50.00.

The fourth session of the Medical Convention of Ohio met at Columbus from the 5th to the 7th of May, 1841.

At this convention it was resolved that each member of the convention be requested to report at the next meeting

as to the existence and condition of medical societies in this State.

The fifth session was held in Cincinnati, from the 16th to the 20th of May, 1842.

The sixth session was held at Lancaster, May 8, 1843.

At this meeting it was resolved that the physicians of each county should organize themselves into a County Medical Society.

The seventh session met at Mt. Vernon, May 28, 1844.

At this session it was resolved that a State Medical Society be formed, to be constituted primarily of at least one physician for each county of the State.

It was also resolved, that a committee be appointed to present a memorial for a charter for the State Medical Society.

The eighth session of the medical convention met in Columbus, in 1845.

At this meeting it was resolved, that delegates from regularly organized county societies be recognized by this convention.

In this connection, a letter which I received from the late Dr. John W. Russell, of Mt. Vernon, a man widely known and highly esteemed, may be of interest. He says: "I am not able to answer your question why the State Medical Convention was given up and a State Society organized."

"As I said before, the meetings were sometimes spoken of as convention and sometimes as State Society. Dr. Baker asked the question, 'Which are we?' No definite conclusion was determined."

"A committee was appointed to draft constitution and by-laws, and memorialize the legislature for the charter, and to report at the next meeting."

"I do not find their report."

"I have no recollection of there being at any time two listinct and separate organized meetings, at the same time nd place, and do not think there were. Only one Presi-

dent was elected, and performing his duties as such, the tacit understanding being that the body in session might be called by the name 'Convention' or 'State Society.'"

The ninth session met at Columbus May 12, 1846.

The following act was passed by the State Legislature February 28, 1846:

SECTION 1. Any one robbing a grave for anatomical purposes or surgical experiments, without consent of relatives, if there are any, or otherwise without consent of the trustees of township, shall be fined a sum not exceeding $100.00, or be imprisoned not more than six months, or both, at the discretion of the court.

OHIO STATE MEDICAL SOCIETY.

On Thursday evening, May 14th, a number of medical gentlemen assembled at the Neal House, in Columbus, to form the Ohio State Medical Society. A constitution was presented and signed, and the society adjourned.

The second meeting of the Ohio State Medical Society was in May, 1847, at the same time as the meeting of the Medical Convention of Ohio.

The only business transacted was to appoint a committee to revise the constitution, and frame a code of by-laws.

May 19, 1847, Prof. Wright offered the following resolution:

"That it is expedient for the members of this Ohio Medical Convention to form a State Medical Society, either as an appendage to this convention, or as a separate organization." Carried.

January 11, 1848, the Society met a third time, recommitted the aforesaid constitution and by-laws to the committee presenting it. They also drafted a bill for the incorporation of the Society.

The Society met again, May 16, 1848, and at this time reported that a charter for the Society had been obtained.

This charter was granted February 22, 1848, and was as follows:

SECTION 1. Be it enacted by the General Assembly of the State of Ohio, That R. Thompson, F. Carter, G. W. H. Landon, A. H. Baker, R. D. Mussey, J. P. Judkins, J. F. Hibberd, Samuel St. John, G. H. Boerstler, R. Hills, D. A. Cox, W. W. Rickey, and their associates, be and they are hereby made a body corporate and politic, by the name of the "Ohio State Medical Society."

SEC. 2. Said association, so incorporated, shall have power to form and adopt a constitution and by-laws, provided nothing therein contained shall be contrary to law, and to alter and amend the same at pleasure.

SEC. 3. Said corporation shall have power to organize auxiliary societies, in any part of this State; shall be competent, through its proper officers, to sue and be sued; shall have and use a common seal, and alter the same at pleasure; shall have power to acquire and hold such scientific and other property as may be necessary, and to do such other matters, and things as are usual in like cases and proper for its perpetuation, and the furtherance of its object.

JOSEPH S. HAWKINS,
Speaker of the House of Representatives.

In the proceedings of the Ohio Medical Society for 1848, John Butterfield, as Chairman, presents the following, in his address to the Physicians of Ohio:

The Ohio State Medical Society has been several years in existence. Nothing is wanting but a combined effort on the part of the profession, generally, to sustain it and make it worthy of the great State which it indirectly represents. Finally, it has been made the subject of a special note and request by the National Medical Association. That body, with entire unanimity, has requested that State medical societies be formed in all States where they do not at present exist.

Your committee hope that this call of the Society will be most cheerfully and extensively responded to by the profession throughout the State.

The meetings of the Ohio State Medical Society have thus far been preliminary, rather than active. Its members have been waiting from year to year, until the minds of

their brethren might be prepared for permanent association, that the objections raised by some might pass away, and that the necessity as well as the propriety of such association might become still more apparent.

The next annual meeting will be held on the 5th of June next, in Columbus. The annual Medical Convention will assemble at the same time. There will be much of interest to be done, and especially much of importance to be planned for the future. Assemble then, and let us advise and work together. Let us throw off all apathy, and in a true spirit and earnest faith, determine each for himself to do what he can."

At a meeting of the Society, held June 6, 1849, Dr. R. Thompson, who had been elected President at the previous meeting, delivered an address devoted chiefly to the regulation of the practice by law.

In this he says (page 27, proceedings of the State Society for 1849): "Without stopping to inquire into the right which one class of men had to care for another, or whether by proscription of law the Legislature can proscribe one set of men and establish another, in regard to a matter of science, or want of it, or whether a community has a right to employ a regular physician or a quack, I may say, in truth, all enactments upon the subject of medicine, prescriptive, proscriptive, or dictatorial, under fines, penalties or disabilities, are extremely difficult of execution, and, hence, impracticable, and soon become a dead letter upon the statute books."

The constant reference which, in these early days, was made to the regulation of the practice of medicine by law, and the evident inability to secure the ends desired, will be of interest to all of us,, showing that our predecessors, no less than ourselves, were unable by any process of law to advance the practice of medicine.

In the records of the Ohio State Medical Society, of the meeting held in June, 1852, upon page 17, in the address of the President, Dr. G. Boerstler, is the following:

"The necessity for a more perfect organization than was afforded by the State Medical Convention was long felt by the profession, and four years ago some dozen members, duly impressed with the idea that an establishment of a properly-regulated society would contribute to the diffusion of medical knowledge, assembled in Columbus, and there formed the nucleus of the present State Society. At the next meeting of the Legislature, a charter was prayed for and obtained, creating thus a corporated body, which gives it a permanence of existence that could not be attained by our State Convention.

"Three annual meetings have been held, and we now number about two hundred and thirty-six members, residing in every section of this great State. By regulation of our by-laws, it was decided to hold our meetings permanently at Columbus, but at the last June session that clause was repealed, and it was decided to hold the meeting of 1852 in Cleveland."

After bestowing much praise upon the entertainment given in that city, he closes by saying: "Indeed, one more reception like this, to use an Hibernianism, would convert this Society to a permanent itinerancy."

In a paper of Dr. Stevens, Ohio State Medical Society Transactions, 1870, page 102, is the following: "As we have seen, these voluntary meetings of the Medical Convention of Ohio continued to be held until 1851, but the State Society was organized in 1846, and for these years, 1846–51, conventions were held simultaneously with the Society, and at the same place. It is not exactly easy to understand why the two organizations were thus continued, especially as the active men of both were the same."

In the written records of the State Society, I find the following record made June 4, 1851:

"The proceedings of the Ohio State Medical Convention were handed in to the President, and being read, on motion, were received, and ordered to be incorporated and published with the regular proceedings of this Society. By invitation, Dr. W. W. Rickey, late President of the Ohio

Medical Convention, then delivered his valedictory, which, on motion of Dr. Judkins, was referred to the Committee on Publications, and ordered to be published in the transactions."

The foregoing sketch of the Ohio Medical Convention, its history, and final absorption by the State Medical Society, is far from complete. It has been gathered, however, after much correspondence and labor.

All that we can say is, that no small amount of time has been expended to save the early medical records of the State, before they were irretrievably lost.

The record is incomplete, and if any one, under whose eye this paper may fall, will kindly aid the writer to more facts, and especially the printed transactions of the Ohio Medical Convention, he will undertake to have the important facts printed in a future report of the Society.

From a study of all that is embodied in the acts of legislation, the journal of proceedings, and the printed papers read at the various meetings of the Society, I have gleaned the following impressions:

In the early part of the century, when settlers were widely scattered, and towns were few, physicians were also few. Those who have left a memory behind them were, as a rule, men of character and influence, earnest in the pursuit of their profession, and philanthropic in their services to their fellows, and their desire to advance the standing of their profession. Gatherings of physicians, though few, were highly esteemed, and the societies which existed had great influence. This influence resulted from the character of the men making up the membership of the societies, and from the power which such societies had to control the practice of medicine and to grant licenses.

The difficulty of securing a good medical education, owing to the lack of good medical schools, together with the lack of competition, arising from the scattered communities and the small number of physicians, led men lacking both knowledge and character to undertake the practice of

medicine. With the increase of quackery an attempt was made to regulate the practice of medicine by law. After attempts to do this in many different ways, the undertaking was finally abandoned as useless, and has never succeeded since, in spite of the numerous attempts in this direction.

An attempt to improve medical education was made by the establishment of the Medical College of Ohio, in Cincinnati, and certain advantages were granted to graduates, not only of medical schools, but colleges of arts as well, exempting the former from examination for license, and the latter from one year of medical study, the time being shortened for them to two years.

After a time an effort was made to require preliminary examinations for those about to enter upon the study of medicine, and to secure some control over the examinations for graduation of medical colleges.

Both these attempts led to serious disagreements between medical schools and the medical profession at large, and were finally abandoned.

The Medical Convention of Ohio was formed in an attempt to advance the standing of medicine, and unite the profession by the establishment of a society which should make itself felt by the intellectual and personal influence of its membership. It did an excellent work during its existence, but was finally merged into the Ohio State Medical Society, a body formed at the request of the American Medical Convention, in order that the medical societies of each State might be in direct affiliation with the national body. The history of medicine in the State since the foundation of the State Society is within the reach of all, so it need not be rehearsed. As a society it may be of interest for us to notice that the most strenuous efforts have been made by our fathers and grandfathers to regulate by law preliminary and medical education, to establish examinations for admission to the practice of medicine, and to exclude quackery. All these attempts have failed.

The question necessarily forces itself upon us whether the advancement of the profession must not be attained through the enthusiasm and labors of the profession, rather than the legal enactment.

Is it not possible that this Society, by the high standard of work done here, may do much to advance the standing of the profession in the State.

Can not the meetings of this Society be made of interest and profit to the general practitioner, and the specialist as well, by the devotion of the time of our meeting to scientific discussion, rather than to questions of organic law and order.

NATIVE AND FOREIGN MEDICINE IN CHINA.

J. G. KERR, M. D., CANTON, CHINA.

"China proper occupies the eastern slope of the table lands of Central Asia. Its form approaches to a square, and covers a surface eighteen times as large as Great Britain. It is inhabited by more than 360,000,000 of the human race, living under the same government, ruled by the same laws, speaking the same language, studying the same literature, possessing a greater homogeneity, a history extending over a longer period, and a more enduring national existence than any other people, whether of ancient or modern times; indeed, when we consider its high antiquity, its peculiar civilization, its elaborate administrative machinery, its wondrous language, its philosophy and classic literature, its manufacturing industry and natural productions, giving rise to such a gigantic commerce with foreign lands, China is, perhaps, the most remarkable country in the world."

The above extract is the introduction to an article on the Chinese Empire in the "Library of Universal Knowledge," and gives us a glimpse of that vast Empire, hidden so long within the walls of its own exclusiveness, but being now invaded by the diplomatic, commercial, religious and philanthropic forces of the West, and whose people, spreading over the world, are bringing a new element into the commercial and labor problems of modern times.

A brief consideration of one or two aspects of the civilization of this ancient Empire will present, in a stronger light, the particular phase of the national life to which we desire to call your attention.

Education, while not general, is encouraged by the government. The rudiments are acquired in self-supporting common schools, but there are no academies or colleges; and advanced studies are pursued in private, or by the aid of private teachers. A very complete system of competitive examinations, established for a period of eight hundred years, and conducted by officers of the government, which all scholars are required to attend, determines the status of all students; and the degrees conferred serve as the incitement for continued effort, extending through the whole life, on the part of those who devote themselved to literary pursuits. Preliminary examinations during the earlier years of study are preparatory to the annual examinations, at which the first degree is conferred; and this entitles and requires the holder to compete at the triennial examination, presided over by two imperial commissioners, by whom the second degree is conferred on about one hundred successful candidates out of ten thousand competitors. The second degree requires attendance at the examination held in Peking for the third, and this in like manner for the fourth and highest.

Literary advancement is the means of securing political honors, and only those who attain the third and fourth degrees are qualified to hold high office under the government.

The triennial examinations for the second degree are held in each one of the eighteen Provincial capitals, and the number of scholars in attendance varies from six thousand to twelve or fourteen thousand, according to the population of the Province. The examinations consist in writing essays on subjects given by the Imperial Commissioners; and as each student writes essays on three different days, within a period of nine days, it can be seen that the essays produced in each capital are numbered by the tens of thousands.

It will not be surprising that, in a country where literary culture is thus fostered, the productions of distinguished

scholars will abound. The printed catalogue of the Emperor Kien Lung's library is composed of one hundred and twenty-two volumes, and the selection of the Chinese Classics, with commentaries and scholia, is said to comprise 180,000 volumes. Historical, philosophical and poetical works are numerous. Dictionaries and encyclopedias, ancient and modern, are without parallel in western lands, unless it be in very recent times. Besides the sages, Confucius and Mencius, there are numerous scholars and authors whose names occupy conspicuous and honored places in the temple of fame and in the memories of the people.

The Chinese language is one of the monuments of antiquity, which has been handed down through the ages without essential change. The Classics, compiled by Confucius twenty-two hundred years ago, from documents which were in existence centuries before, and some of which are considered as among the oldest specimens of human writing, show that the written language had attained a high degree of perfection in his time. These sacred books, which in their present form are more than twenty-two centuries old, are the text-books of to-day for the higher education of the literary men of the Empire. This is not the place to dilate on the excellencies of the Chinese language, but it is to be noted that a language which has served the purposes of the most populous nation of the earth, through the longest period of time, in all departments of life, must have some excellencies which are worthy of study.

When we turn our attention to the state of medicine in such a country as we have outlined, a feeling of surprise and disappointment will be experienced to find that it remains in a very crude and primitive condition. Physicians in cities and villages are numerous, but it can not be said that there is a medical profession. There are no medical schools, no medical periodicals, no medical societies of any kind. Medical literature is abundant, but it is not to be

compared to that in other departments. Physicians, as a rule, do not belong to the literary class, but their education must be sufficient to enable them to read the medical books and write prescriptions. The law prescribes no qualifications, and any one is at liberty to practice who chooses to do so. Works on the practice of medicine, describing diseases, and giving recipes for their treatment, together with treatises on medicines and their uses, comprise the books which are read by those who aspire to practice.

When it is stated that the sciences do not enter into the education of Chinese scholars, and that anatomy, chemistry, physiology, and pathology are unknown, as branches of medical education, it will be seen that the curriculum is very limited, and that all practice in China is purely empirical. Taking a glance, however, at the vast population, upon which, during so many centuries, an innumerable host of physicians have had an opportunity of experimenting, we would expect results in the means of curing disease far beyond what have been attained. The books contain many prescriptions which are regarded as standard remedies in given cases, and there are numerous secret medicines, which have a wide circulation, but so far as I know, there are no remedies which would be an addition to our means of combating disease.

The "Pun-tso," the standard work on materia medica, is in thirty-two volumes, and describes medicines derived from the three kingdoms of nature. These may be divided into three classes: 1. Such as are common to us and to them; 2. Those which are inert; and 3. Those which are unknown to us. Those included in the third class consist mostly of vegetable substances, and when the botany of China is thoroughly studied, many of these will prove to be known to us, and to belong to either the first or the second of the classes named above.

The theories which guide the administration of medicines are of such a nature as to obstruct the acquisition of

correct knowledge. The organs of the body are supposed to hold certain relations to the five elements—earth, air, wood, fire and water—and the relations which a given medicine is supposed to hold to one of these elements decides the applicability of the medicine. It is thus seen that clinical observation could not lead to a correct knowledge of virtues of medicines as therapeutic agencies.

The Chinese have never, in any department of knowledge, inaugurated and carried out processes of investigation with a view of arriving at truth, and eliminating error. They are, therefore, destitute of scientific knowledge, and in so important a matter as the use of remedies for the removal of disease, they possess no methods which are the result of careful observations conducted on rational principles.

Having no knowledge of chemistry, they use all medicines in the crude state, and having no accurate knowledge of the virtues of simple medicines, their compounds are made up of numerous ingredients put together in accordance with the fanciful theories referred to above. Notwithstanding all the ignorance and absurdity involved in the theory and practice of medicine, the people have great faith in their medicines, and take more than any other people. Confidence in their doctors is not as well established as in the medicines. If one or two doses of a prescription given to a patient does not produce the desired effect, another doctor is called, and it is no uncommon thing for a patient to be prescribed for by three or four doctors in one day.

The entire ignorance of anatomy precludes any proficiency in surgery, and, in fact, no one of their numerous physicians pretends to perform the simplest surgical operation. The opening of abscesses, or the removal of tumors, is not attempted. The tying of an artery seems never to have been thought of, and the fear of hemorrhage has prevented the use of any cutting instrument. The extraction of teeth when they become loose, or the application of a

poultice, or of splints to a fractured bone, may be said to comprise the whole of surgery as known in the oldest and most populous nation on the earth. As a consequence, all the diseases and injuries which are capable of relief by surgical aid go on, involving life-long misery or inconvenience, or result in death.

No attention is paid to hygiene, and no measures are adopted by public authorities for the protection of communities from epidemic diseases, or for the isolation of patients suffering from contagious diseases.

Hospitals for the cure of the sick, asylums for the insane, the deaf and dumb, and for incurables are unknown. These institutions exist only in Christian countries, or where Christianity takes them. The friendless poor are often cast into the streets to die; the insane and incurable, who become a burden to the family, die from neglect or ill-treatment, and there is reason to believe that not a few of them are put out of the way. The head of a family has the power of life and death over its members, and it would not be strange if the quickest and surest method should be taken to get relief from the burden and danger of an insane member.

To remedy such a state of things in India, the second most populous country of Asia, the British government has established sixteen hundred hospitals and dispensaries, and has opened eighteen medical schools for the instruction of native youth, and thousands of qualified native physicians are now engaged in practice in that country. Twenty-five asylums are provided for the insane, with all the best methods and appliances known to the profession in Europe and America. The benefits conferred upon the human race by the labors of medical men — all the improvements of modern scientific research and toilsome experiment — have been given to the millions of India without any effort on their part — without even the asking. For this grand work done by our kinsman and professional brethren of the British Isles, Christian civilization must have the credit.

The Empire of China is under the rule of a native dynasty; has been slow to adopt the modern improvements of western nations, except such as would conduce to the power of her army and navy. The Christian churches in Europe and America, which have established agencies in that Empire for the propagation of christianity, have appreciated the sufferings of the people arising from the ignorance of their physicians, and have established a system of medical missions, which have done a vast amount of good, and have prepared the way for the introduction of modern medicine and surgery into that Empire.

The first medical missionary to China was Dr. Peter Parker, who landed in Canton in 1834. He established a hospital in 1835, which he conducted for twenty years, and since 1854 it has been under my charge. The Medical Missionary Society in China, the first of its kind in the world, was founded in 1835, and under its patronage the medical work in Canton has been sustained for more than half a century.

After the war with England of 1840–42, five ports were opened to foreign commerce, in which hospitals were established by missionary physicians, and as the country was further opened by the war of 1857–58, the number of hospitals increased, so that now there are more than sixty hospitals, between forty and fifty dispensaries, and about one hundred and thirty medical missionaries, of whom twenty-five are women. Besides the medical and surgical work done in all these hospitals and dispensaries, giving relief to tens of thousands of patients whom their own physicians could not cure, medical books have been translated into the Chinese language, and native students have been trained in principles of western medicine.

It is thus seen that medical missionaries, aided by their societies in Europe and America, are doing for China, by a slow and gradual process, what the British government did for India in a comparatively short time. They are placing in the hands of the Chinese the benefits of all the labors

of the men who have brought to such perfection the means of curing disease and relieving suffering, which has made our profession such a blessing to the human race.

A few facts in reference to one or two lines of practice will give some idea of the vast benefit conferred on the Chinese by western medicine. The first operation for the removal of urinary calculus was performed in 1844 by Dr. Peter Parker, in Canton. In sixteen years he operated on thirty-two cases. In 1865, there were seventeen operations; in 1869, thirty-five operations, and in 1875 the number of lithotomies and lithotrities amounted to fifty. Since that time they have averaged in the Canton Hospital more than fifty each year. Last year my young associate, Dr. J. M. Swan, a native of Ohio, operated on fifty-nine cases, with fifty-seven recoveries, and the result of two not known, and Dr. Mary Niles on two cases in the female. Altogether, not less than sixteen hundred operations for urinary calculus have been performed, the most of them in Canton, giving relief to a disease which has caused untold suffering and death to thousands, and for which the native doctors had no means of cure.

Urethral	160
Preputial	32
Scrotal	2
Kidney	1

Every physician knows the terrible dangers to which women are exposed in cases of difficult labor, and how often death can be warded off by methods which modern science has placed in our hands. We can not compute the number of women and unborn children annually doomed to death in an Empire of 300,000,000 of people for the want of the methods and the skill possessed by all our physicians. Dr. Mary Niles, the lady physician in charge of the female department of the hospital in Canton, reports her obstetrical practice for 1892 as follows:

Dead before arrival of physician,	5
Forceps deliveries,	31
Requiring version,	7
Craniotomy,	7
Delivery of head left in utero,	1
Manual assistance,	5
Extraction of retained placenta,	9
Placenta previa,	1
Sundry cases,	38

Altogether, one hundred and four cases, in five of which mother and child were both dead before the foreign physician was called, and more than fifty of the remainder required operative interference. The instance in which the body was torn away by the native midwife, and the head left in the utero, a like case having occurred to me some years ago, shows how utterly helpless they are in the presence of difficulty, and to what barbarous treatment the midwives, in their ignorance and desperation, resort. Multiply these figures of one year for one city by the hundreds of cities and thousands of villages, and you get a glimpse of the sufferings which fall to the lot of women in an Empire which is without the blessings conferred by rational medicine and surgery. Then multiply the thousands who suffer and die in one year by the years of a century, and the result shows by contrast what an inconceivable amount of good is conferred on the human race by the science and skill of the medical profession to-day. This simple computation will also give some idea of the humane and philanthropic work in which medical missionaries are engaged, even if you leave out of the count the vast good done by them in removing prejudice and conciliating the people, thus opening the way for the herald of the Gospel.

In the department of dentistry, the Chinese have, strange to relate, anticipated by centuries the profession in Europe and America, in the insertion of artificial teeth. Utilizing the femur of an ox, and sawing a circle of half or three-quarters of an inch from the shaft, a section of this circle

is used, sufficient to fill the vacant space in the mouth. The section of bone is then dressed with a file, so as to imitate the teeth to be replaced, and through holes drilled in each end copper wires are passed to fasten it to the adjoining teeth. These artificial teeth are designed more for good looks than for purposes of mastication, and since the cost of inserting three or four teeth amounts to about twenty-five or thirty cents, this means of remedying uncomely defects is within the reach of all.

American and English dentists of high standing have practiced their profession in Hong-Kong, Shanghai, and other cities open to foreign commerce, and have employed Chinese young men to assist in the mechanical part of the work. With the talent for imitation for which the race is noted, these young men have not been slow to avail themselves of the opportunity of learning the more delicate parts of the work performed by the dentist himself. A number of these young men have become successful practitioners among their own countrymen, and with foreign instruments and material are superseding the crude and unsatisfactory work of the native artists. They have not yet attained to the skill in the treatment of diseases of the mouth which requires scientific knowledge, but that will come in time.

The theory that toothache depends on the presence of worms in decayed teeth is universally believed, and is demonstrated by a process peculiarly Chinese, and which was investigated some years ago by Dr. Rogers, a dentist of Hong-Kong, and myself. The native operator holds back the lips with a wooden spatula, while he works around the offending tooth with a pointed instrument until there is a flow of saliva and blood. Adroitly turning the spatula, and placing the other end in the mouth, a piece of delicate paper, attached to one side, is moistened by saliva, and the worms, confined under it, are liberated, and become mixed up in the bloody saliva. With a pair of forceps the operator picks them out, and satisfies the patient.

Cholera is a disease which is now attracting special attention in the country. It is endemic in India and China, and spreads over these countries from time to time as an epidemic. In China, no measures are adopted for the purpose of protecting communities from disease, or to prevent the spread of epidemics. The dense population, the want of drainage, the impure water supply, and the presence of decaying vegetable and animal matter in the streets and canals, under tropical heat, afford the best possible conditions for the generation and propagation of cholera. The absence of statistics renders it impossible to say whether the mortality of this disease is greater where preventive hygienic measures are disregarded, but the rise, progress, and decline of epidemics seem to follow very much the same course as in countries where the most stringent measures are enforced.

It is a notable fact that the epidemics of cholera in the United States have been introduced only from Europe. This was not strange when there was no steam communication between our Western coast and Asiatic ports. During the last eighteen years, regular lines of steamers have been carrying many thousands of passengers. Sailing from Hong-Kong, and calling at Yokohama. During this time, several epidemics of cholera have prevailed in China and Japan, and, although steamers have brought passengers from infected districts, and called at an infected port, yet the disease has never been introduced by Chinese immigrants. In many instances the steamers have been quarantined because of small-pox, but, so far as I know, never because of cholera.

I refer to the subject of fever only to say that yellow fever, the scourge of intertropical America, has never been known to occur on the east coast of Asia. Canton is on the same latitude as Havana, and the intertropical countries and islands of Asia are much more populous than the Central and South American States and West India Islands. The fact that yellow fever does not prevail, is

most remarkable, and for which that part of the world may well be devoutly thankful.

This brief outline of native and foreign medicine in China is sufficient to show that the populous countries of Asia afford wide fields for research in the various departments of science connected with our profession. To botany and chemistry we look for the development of the resources of the vegetable and mineral kingdoms in those unexplored regions, and from which valuable additions may be made to our armamentarium.

In the study of disease, under conditions of climate, sanitary surroundings, and habits so entirely different from those known to the profession in Europe and America, we may look for that increase of knowledge which comes from an enlarged view of subjects under investigation.

For the antiquarian, and those who are interested in the origin and influence of the fanciful theories of disease and curative agents, universally accepted by so large a portion of the human family, the history of native practice in China affords an inexhaustible field of study.

There are at this time about one hundred and thirty medical missionaries located in various parts of the Empire, who study the language of the people and become familiar with their habits aud surroundings, and whose duties require them to study their diseases. There are also more than one hundred European and American physicians engaged in private practice in the foreign communities of the open ports. Some thirty of these are connected with the Imperial Maritime Customs Service, who are required by the rules of the service to write semi-annual reports of their observations on the diseases of the port where they are located, which are published as Customs Medical Reports.

From all these observers in this new field we may look for valuable additions to our knowledge, but time is required, since the native sources of information are untrustworthy, and all statistics must be gathered under unfavorable circumstances by the observers themselves.

When I went to China, in 1854, but one work on foreign medicine had been prepared in the Chinese language. This was an outline of Anatomy and Physiology, by Dr. Benjamin Hobson, medical missionary under the auspices of the London Mission. This was succeeded by three other manuals by the same author, on Surgery, Practice, and Obstetrics, and one on Natural Philosophy. These five volumes were well adapted for introducing the science and practice of Medicine, Surgery, and Obstetrics to the people of that empire, and they attracted the attention of men in high position as scholars and officials. The work on Anatomy and Physiology was republished, with all the illustrations, in the best style of native art, by an official of high rank, and a complete edition of the five volumes was issued in Japan, and laid the foundation there for the early acceptance of western medicine by the leading men of that empire.

As much of my time as could be spared from the daily duties of hospital and dispensary work was devoted to translating medical books. To the works of Dr. Hobson have been added a treatise on Chemistry, four volumes; one on Materia Medica, four volumes; Surgery, seven volumes; Theory and Practice, five volumes; Physiology, four volumes; Diseases of Women, five volumes; Diseases of the Eye, one volume; of Skin, one volume. Gray's Anatomy has been translated by Dr. Osgood, an American, and also by Dr. Dudgeon, an English physician, and the Companion to the British Pharmacopeia has been translated by Dr. Hunter, and other works are in course of preparation.

We have now text-books on the chief branches of medical science translated into the Chinese language, which, in its written form, is the same throughout the whole empire, and these text-books reach the physicians of the most populous nation in the world, and will, in time, revolutionize the medical practice which is now so highly esteemed because of its antiquity.

Medical classes are formed in many of the missionary

hospitals. A medical school has been organized in Hong-Kong, under the patronage of British officials and leading merchants in that colony, and the introduction of scientific and rational medicine into China, with the untold blessings it brings to suffering humanity, is secured.

While you, in common with the members of the profession throughout this country and Europe, are engaged in earnest labors to increase our knowledge, and to add to the means of relieving human suffering, and prolonging human life, the humbler, but not less important, task devolves on us, who have devoted our lives to the work of medical missions, of transferring the knowledge which you have accumulated, to the languages of Asia, and Africa, and the Islands of the Sea, and thus conferring upon vast multitudes of our fellow-men the inestimable blessings, not only of true religion, but of rational and scientific medicine.

HOUSE AND HOME SANITATION.

By H. J. Herrick, M. D., Cleveland, Ohio.

Along with life, all living have a common instinct to avoid death. To avoid disease, as the precursor of death and the prevention of pain, is equally deep-seated in our very nature. This is the impulse of all life, and especially that of rational life, hence we find that among men of all ages the highest consideration has been given to the health, life, and well-being of the body. In considering the deeper part of our subject, the conclusion follows, without question, that the same supreme wisdom which determined the complex mechanism of man also determined the laws and conditions for his well-being.

Those conditions existing, it rests upon the medical profession to determine the laws, and formulate them into rules and teachings for the guidance of the people. This is the ideal of Sanitary Science, and is the mission of the high-minded, active, and philanthropic physician of to-day. Is it not a new obligation, and one that is rising up before us so imperatively that we can not put it away? Physicians had thought their mission ended when they looked to the cure of disease; now they must, as well, prescribe for its prevention.

In my paper I am asked to direct the thought of this Society in the line of House Sanitation.

When we consider the different factors involved in this subject it is obvious that the problem is complex, and its solution is not an easy task. If unskilled architects are secured to plan the construction of the house, they often sacrifice to taste, or supposed advantage, vital

principles of sanitation. Again, when we consider the expense involved in putting into use the answers to the different problems, the average householder is overcome by the burden. As many of the most fatal diseases seem to be generated in the attempt to create a private climate, with private appointments for the wants of the members of the family, we see that the importance of the subject gives it a high place in sanitary science. These troubles arise from unhealthy sites, impure and stinted water supply, faulty construction, insufficient ventilation, defective drainage, and general accumulations of filth.

The great question is, What must the house and its environments supply if it shall meet the demands of a living, healthy body? Architects and builders of to-day have not kept pace with sanitary science. They are almost culpably indifferent to the health of the future occupants, and seem often to care only for the beauty and symmetry of our houses. The time is not far distant when the physican will be called in for consultation in the selection of a site and the erection of a house.

In enumerating the general demands under different heads, I include more than those which belong simply to the house. Those that belong to the home and its appointments must be considered as well. There must be provision for a supply of:

1. Pure air for respiration.

2. Pure water for the multiplied changes involved in all the vital phenomena, as also for the cleanliness of the person and home.

3. Right food for the wants of the body, and adapted to the age, occupation, and peculiarities of the constitution.

4. The temperature of the house should be maintained at an equable degree; evenly distributed and adapted to the age and different bodily conditions of the occupants.

5. Lighting appropriately by day, as well as by night, is worthy of intelligent care.

6. Though clothing is not a part of the house appointments, it constitutes a demand closely connected with the uniform temperature, and in civilized society becomes the agent and witness of health, taste, and culture.

7. The house bears a certain interest in and relation to the occupation of its occupants. Health is always activity alternating with rest. The house should, in all individual cases, be in accord with taste, and within the means of the tenant, at the same time supply the conditions for rest and restoration to the weary laborer.

From this general survey of our subject, it is obvious that the problems are complex, and their solution is not always an easy task. Also, as was said before, the expense involved in putting into practical operation the answer to these questions is no small item, so that, in the construction of a house, the most simple plan to meet the ends desired should be secured. In discussing further the different divisions of the subject, the question as to location of the house, relative to elevation, character of soil, facilities for drainage, distribution of outhouses, stable, etc., becomes one of prime importance. It should always, so far as possible, rest upon an elevated position, even at the expense of being off the main thoroughfare.

The substances upon which it should be built, in the order of their healthiness, are: 1. Those overlying the primitive rocks; 2. clay slate; 3. millstone, grit, and oolite; 4. gravel and loose sands; 5. chalk; 6. sandstone; 7. limestone, and 8. clay.

A house should never be built on new-made soil. Trees should be in the vicinity, but neither too thick nor too close to the house.

It should, with its main living rooms, face the East or South, so far as practicable, and should be built of brick, except in very warm climes, when frame is preferable. The walls, whether of brick, stone or wood, should be double, for warmth, coolness and ventilation. It should be elevated

from the ground, with a good cement cellar under the whole, while, to prevent dampness from the foundation, a layer of slate should be laid in the wall above ground. (Glazed earthenware tiling may be used in place of slate, as a matter of taste).

Special attention should be paid to the cemented bottom of the cellar, so as to prevent the ground air, which is rich in carbon dioxide and other miasmata, from entering the house. No drain should traverse the basement, and all old ones should be destroyed.

Too little attention is paid to water closets, their position and arrangements. They are often put in out of the way parts of a house, where artificial light is required, and where the sun never reaches them. It seems needless to say that they should be in a light, airy place, thoroughly ventilated, or entirely separated from the main part of the house.

The sources of impurities are many, and quickly render the air unfit for respiration, a function which must continue unimpaired during the life of the individual.

The impurities of the air may be classified from their source. 1. Expiration and exhalations from those occupying the house; they constitute a poison known as ochlitic.

2. Emanations from fecal or urinary evacuations or expectoration, and all gases arising from sewers and cess pools. Such a poisonous air is called miasm.

3. Noxious gases from combustion; they are combinations of carbon, sulphur, phosphorous, etc., with oxygen, and arise from combustion used for heating, lighting or cooking.

4. Gases arising from vegetable decomposition, as from marsh district, or decomposing vegetables within the house. They are formed from the vegetable mold of the soil, hence ground air is loaded with them. They, with accompanying bacteria, are regarded as the specific malarial poison, which produces the well-known types

fever. The poison is usually borne to the house from without, through the air, but there is no question that it is often carried in the current of ground air; hence the importance of ventilation in cellars and protection with concrete bottoms.

For ventilation, openings for the ingress of fresh and the egress of foul air should be variously located, so as to allow of free circulation without drafts, and are always to be provided for along with the arrangements for heating.

These requirements are so simple and obvious that we should suppose no one could go amiss at this day, and fail to provide so important means for the health and life of the occupants. Yet, recently, I was called to treat a malignant case of diphtheria in the father, whose son had recently died of the same disease. The house was of modern style, yet the air of the rooms was foul. I directed a fire made in an apparently open grate, when I was informed that there was no flue, and that it was a sham grate. I advised lighting a gas log in the hall below, and was told that it also was a sham. I went to the kitchen, and found that the cooking was all done by gas stoves, and all the burned gases from combustion and vapors from cooking were allowed to pass through the house, which was heated by a furnace, without the least outlet for the escape of foul air. In the case of the patient which had died, after many consultations and final intubation, no attention had been given to the most important requisite for the little sufferer — a liberal supply of fresh air. This was the medicine required by my patient, which, on being supplied, the grave symptoms immediately abated, and he made a rapid recovery by the aid of simple remedies. Is it not obvious that in this case, as in many others of a similar nature, the thought of the physician is often directed to the germs, regarded as the specific agent in *causing* the disease, rather than the *essential* conditions for healthful life?

Under the second head of requirements for home sanita-

tion, a right food supply occupies no inferior place. It will be observed that, in this presentation, I use the term home sanitation as identical with house. Many of the diseases among the young and old, women and feeble ones, are caused by unsanitary conditions of house or home, so that it is not easy, in the attempt to solve the problem as to their cause, to separate the house as a habitation from the home, which includes the house and the internal management of its occupants. The disorders of the digestive organs testify to the great need of care in the direction of food supply. No house or home sanitation can be regarded as complete unless the recurring wants of the occupants are to be met by wholesome food, properly cooked and adapted to the varying ages and occupations of each. Here is a field, fruitful in good to those who give diligent heed to its care.

The third requirement for house sanitation is a liberal supply of pure water. The fact that from sixty to ninety per cent of the different tissues of the body are water; that all solid tissues were held in solution in water, and thus carried to their place and deposited; and that all the old worn out or effete tissues, in order to be disposed of from the body, must be re-dissolved and eliminated by the aid of water, renders its free and constant use a necessity. Further, when we reflect that soft water has greater solvent powers and is without irritating properties to the tissues, we can not over-estimate the importance of this property. Its liberal use for personal and general cleanliness should also be regarded — from sixteen to twenty-four gallons being required for each person per day for meeting all the wants of the person and general cleanliness.

The fourth requisite is the securing and maintaining of proper temperature. As to the degree of heat in the different rooms, variable opinions prevail. That of the sitting room should be between 65° and 75°; that of a sleeping room as fresh and cool as out doors for every healthy person. If feeble or delicate, some modification

should be made. As before indicated, the heat should be supplied evenly, without drafts, to each apartment. It should always be considered along with the problems of ventilation and lighting. Many of the appliances for these ends seek heating and lighting, while they entirely ignore the question of ventilation.

The fifth and sixth requirements mentioned pertain more directly to the care of the person, though closely identified with the provisions of the home. The dress and activity of the occupants play a most important part in the questions which relate to their health. In so brief a summary it becomes obvious that the problems for house sanitation are many and complex. Yet a moment's reflection is sufficient to indicate their every-day importance. The general practitioner has done much if he has been able to administer fresh air for the pallid cheek, pure water to one who has been infected by the baneful microbes, wholesome food to the disordered digestive organs, exercise for flabby muscles, clothing that shall protect and not burden or compress, and so contributed unquestioned means for the continuance of health, or the restoration of those prostrated by disease.

DISCUSSION.

DR. THOS. HUBBARD.

The essayist spoke of a very important factor in house sanitation, viz., the quality of air in the soil and basement. The index of the sanitary condition of any house may be found in the cellar or basement. Every house is virtually a shaft, and the air is constantly rising from the basement to the upper stories. This is especially true in Winter, when there is greater difference between the average temperature of this shaft and the atmosphere, and, consesequently, the air of the basement is displaced upward into the living apartments. Bacteriologists tell us of the composition of the soil, of the different gases therein found, and with every difference of barometric pressure the soil in the basement breathes. The air enters the soil,

then comes out of the soil, and in the case of the basement the soil exhalation is forced into the basement and then displaced into the rooms above. It is important to see that the basements and cellars are properly ventilated, and once this is secured we have done away with the contamination of air from furnaces drawing air from the basements.

DR. JOHN P. SAWYER.

In the course of the paper the remark was made that there was no provision for the outlet of the air in the room. This statement, while perhaps correct in the sense intended, carries with it an error, in that no house can be furnace-heated without crowding out the air in the room. While it is a good suggestion that basements be kept so pure and clean that the atmosphere supplied from them will be suitable for breathing purposes, in practice, it seems to me, we would be more likely to obtain *pure* air if we drew it from the outside, as in the ordinary cold-air box; yet, in this connection, in the supply of atmosphere by this mean to a furnace, we do not supply moisture. The atmosphere supplied from the outside, at the temperature of the ordinary Winter's day, say ten or twelve degrees, when saturated, contains in a cubic foot of atmosphere perhaps a grain or seven-eighths of a grain of moisture.

The atmosphere is usually only about seventy per cent. saturated. A cubic foot of this air, heated to 70°, contains about .3 grains of moisture. We are, therefore, said to be breathing "burned" air. The atmosphere is just as good, but its relative portion of moisture is less than it should be. The consequence is, most of the people are breathing atmosphere containing less than a grain of moisture per cubic foot, whereas, it should contain six grains to the cubic foot. I know, personally, since my attention was drawn to it last Winter, that in not one in ten of the houses so furnace-heated and supplied is observed the precaution of keeping water evaporating, and nine-tenths of their dwellers are living in practically a dry atmosphere. Now, this dry atmosphere, containing as it does dust, etc., reaches the lung in a thoroughly saturated form, from passing over the mucous membrane of the nose, throat, and trachea. This saturation of dry air by evaporation from the blood causes a certain degree of congestion, and a

reflex irritation is set up. A catarrhal condition is caused. A few cases were brought to my knowledge, which steadily continued in spite of medication, but on supplying six grains of moisture to the cubic foot of atmosphere, instead of half a grain, the relief was very considerable. So great was the relief, in fact, that when the servants failed to keep moisture in the tank, the patients were, in several instances, able to locate the trouble at once, and direct the servants' attention to it.

A few points of this character are of importance in house sanitation. They are points which do not amount to much at any one time, but continually acting, they produce quite an effect. In the question of house heating, it is of importance to supply a proper amount of moisure in the air as well as to supply heat.

THE PRESIDENT.

The grandfather of the Dr. Cushing who addressed this meeting, said he was able to trace the course of epidemics, such as fever, etc., by remembering the locations of the low and high grounds. He found more disease along where fillings had been made than where the ground was originally high.

DR. THOS. HUBBARD.

With reference to the addition of moisture to the air of warm furnaces, I wish to call attention to the false feeling of security which often obtains. The amount of water which can be added by means of the ordinary evaporator placed in furnaces is very small. If the water is well exposed to the heated air, five grains to the cubic foot might be taken up. In eight rooms, 15 x 15, 10-ft. ceiling, there would be required something like 90,000 grains, or 120 pints in 24 hours. This allows for changing the air in the room twice an hour. There are very few care-takers or servants who will put six or eight buckets of water in the evaporating pan daily; and still more rarely will you find an evaporating apparatus that will allow the evaporation of the amount required to raise the humidity appreciably.

Often these evaporating pans are small cess-pools, from the fact that dirty water is used, and the sediment accumulates daily, and a great stink of burning organic matter is created when the pans gets dry and furnace is hot.

DR. SAWYER.

In reference to the amount of moisture which the atmosphere is capable of containing, one gentleman told me he had for a considerable time kept a record of the number of pails of water required for his furnace, and he had found eight pails a day at zero temperature were evaporated, which will only corroborate the accuracy of the computation just made by the previous speaker.

INFANT FEEDING.

By Edward F. Cushing, M. D., Cleveland, Ohio.

During the past few years some notable advances have been made in the study of infant feeding, tending to put the whole matter on a more exact and scientific footing. For this gain of precision in theory and practice we are largely indebted to the members of the American Pediatric Society, and especially to Dr. Rotch, of Boston, to whose valuable work I shall have frequent occasion to refer, for it is my purpose in this paper to attempt a review of the recent improvements in infant feeding, with their bearing on the present status of the subject.

Before taking up the question of the artificial feeding of infants, I wish to speak of the simple method devised by Dr. Holt, of New York,* for the examination of human-breast milk. The clinical value of the examination of breast milk is often overlooked in practice. The character of the milk in cases where infants are not thriving at the breast is but guessed at, and children are, for slight reasons, weaned, or, on the other hand, allowed to continue at the breast improperly, when a milk analysis would, in many cases, enable the physician to precisely determine whether the milk was unfitted for the infant's nutrition, or capable of modification, so as to make it a proper food. Dr. Rotch has indicated† within what limits faulty breast milk may be modified, the deficient fat in a poor milk being increased by an nitrogenous diet, and an excess of albumin-

*The Clinical Examination of Breast Milk, *Archiv. Pediat.*, *March*, 1893.
†Trans. Am. Pediatric Soc., Vol. II, 1890.

oids, lessened by exercise or the administration of diluents at the time of nursing.

In the city, accurate milk analyses may usually be had, but are necessarily expensive, while elsewhere such analyses are practically unattainable. The plan of Dr. Holt, however, puts in the hands of the physician a simple method, easy of employment, and giving results accurate enough for clinical purposes. It promises, therefore, to be of much assistance in the study of the problems of infant nutrition. The method consists in an estimation of the percentage of cream in the milk, with a determination of the specific gravity. The amount of sugar is found to be almost uniform in all specimens of breast milk, so that variations in specific gravity must depend on varying proportions of the proteids and fat of the milk. By the use of a cream gauge and lactometer the percentage of cream, and the specific gravity are determined. And with these factors, the amount of proteids is deducible, giving the data for a quite accurate estimation of the character of the milk. Dr. Holt has prepared a table, which enables one to determine these results at a glance, without calculation. I have here, and will pass about, his apparatus, with directions for use, which may be of interest to some of you.

Passing to the subject of the artificial feeding of infants, it may be accepted that cow's milk furnishes the best medium as a substitute for mother's milk, when so modified as to approximate the chemical constitution of the latter. I may briefly remind you of the chief differences between cow's milk and human-breast milk. There is a larger percentage of albuminoids in the former than in the latter, and a less percentage each of fat and milk-sugar, while the reaction of the latter is usually acid, and the former alkaline. An average analysis of each may be tabulated as follows:

	Breast Milk.	Cow's Milk.
Fat,	4. %	3.75%
Albuminoid,	1–2. %	3.50%
Sugar,	7. %	4.30%
Ash,	.2%	.65%
Water,	88. %	87.30%

The correction of these differences for clinical purposes, so far as the chemistry of the milk is concerned, is met in quite satisfactory fashion by the well-known milk and cream mixture first advocated by Dr. Meigs, of Philadelphia, and known as the "Meigs' Cream Mixture." Its composition is as follows:

Cream,	2 parts.
Milk,	1 part.
Lime water,	2 parts.
Sugar water,	3 parts.

(The sugar water being made by dissolving 18 drachms of milk-sugar in a pint of water.)

This food meets the necessary indications of imitation of mother's milk in specific gravity, richness in fat, sweetness and alkalinity. More serious questions are, however, involved in the problem of infant feeding than the mere elimination of the difference in chemical composition between cow's milk and human breast milk. These are to be found in the danger of bacterial infection of the former. Breast milk is a sterile food, while our ordinary milk supplies are exposed to danger of contamination from a great variety of sources. Filthy dairies, unclean milkers, cows badly cared for and with dirty udders, improperly fed or diseased, represent frequent sources of contamination leading to early souring of the milk or other injurious chemical changes. There seems no reason to doubt the possible transmission of tuberculosis by means of the milk from tuberculous cows, while epidemics of typhoid fever, diphtheria and scarlet fever have been clearly traced to the infection of milk at

the sources of supply. Strict sanitary inspection of dairy farms, insuring proper care of the cows, removal of all but healthy animals from the herd, and enforcement of the greatest cleanliness in all details of collecting and handling the milk, would largely eliminate these dangers. But such a general reform in dairy hygiene and adoption of these important sanitary matters in milk production is only to be expected in the future.

It was hoped that in the *sterilization of milk* by steam a remedy for these evils was to be found, the process by the destruction of the bacteria in the milk delaying souring and destroying pathogenic germs, if present. But while milk and cream sterilized at 212°, and used in the preparation of artificial food proved itself of great value as a dietetic resource in the prophylactic and direct treatment of the gastro-intestinal affections of infancy, it was soon found by clinical observers* that in many cases sterilized milk, employed as a constant food, was deficient in nutritive value; while chemical investigation† showed certain changes in the albuminoids and fats of the milk, resulting from sterilization, which explained its less ready digestibility. But it has been found that while milk sterilized at 212° is so altered in chemical composition as to impair its nutritive value, yet at temperatures between 165° and 170° the milk is not impaired by coagulation of the albuminoids, though rendered as practically sterile when tested by bacteriological examination‡ and delay in souring as when sterilized at 212°— while the lower temperature is probably also sufficient to destroy the pathogenic germs which the milk may harbor. As chemical and clinical results seem to show that by this low-temperature sterilization or Pasteurization the drawbacks associated with ordinary sterilization are in larger measure removed, its use becomes of the

*Dana.—Am. Jour. Med. Sci., June, 1891.
†Leeds.—Am. Jour, Med. Sci., June, 1891.
‡Jackson.—Brit. Med. and Surg. Jour., July 21, 1892.

greatest value as an aid in the preparation of artificial food. Dr. Freeman, of New York, has devised a simple and practical apparatus* for the low-temperature sterilization of milk, which consists essentially of a tin pail with a cover and a rack of zinc cylinders for the bottles of milk, which can be inserted into the pail; the principle of the apparatus being that a definite amount of boiling water in the pail will give up enough heat to raise the temperature of a definite quantity of milk in the bottles to the desired point of 167° F. (75° C.).

While the Meigs Cream Mixture, above described, proves itself, in most cases, an excellent substitute for human milk, and while low-temperature sterilization eliminates most of the dangers connected with an ordinary milk supply, yet, for the preparation of an ideal artificial food, more certainty as to purity of material is desirable, with greater accuracy in composition, and ability to vary the percentage of the constituents with exactness. To this end there has been established, in Boston, through the agency of Dr. Rotch,† a milk laboratory, where the infant food may be prepared with the same accuracy as a drug prescription at a pharmacy. This milk laboratory has proved itself of such practical importance, and the details of its operation are of such interest that I shall quote from Dr. Rotch's own description: "As purity of the milk supply is the first object to be obtained, the herds of cows are specially selected as to breed, and fed and cared for with the special intention that their milk is to be used for infant feeding. The food, drinking water, stable accommodation, and care of the herd is under expert supervision. The cows are milked directly into glass pails, and the milk, after being cooled to about 44° in a tank of ice and water, is delivered at the laboratory in glass jars, within four hours of the milking. This milk shows an average and almost stable analysis, as follows:

*On sterilization of milk at low temperature. Med. Rec., July 2, 1892.

†Rotch.—Value of Milk Laboratories, Archiv. Pediat., February, 1893. Improved methods of modifying milk for infant feeding, B., July, 1892.

Fat,	3.75
Milk-sugar,	4.30
Albuminoids,	4.00
Mineral matter,	.65
Total solids,	12.70
Water,	87.30
	100.00

Its reaction is so faintly acid that it requires the addition of one-twentieth part of lime-water to make the reaction correspond to human milk. At the laboratory the atmosphere is kept pure and fresh by means of a large revolving fan, and the walls are lined with white tiles. The milk is at once passed through a separator, which extracts practically the entire quantity of fat in the whole milk, and removes, as well, any extraneous matter which may be present. Having obtained in this way a pure, fresh, clean-skimmed milk and cream of a stable percentage, it is possible, with exactness, to recombine these fluids in such proportion as to produce the desired mixture in the percentage of fats and albuminoids for the artificial food. For the increase of the sugar percentage a standard twenty per cent solution of milk-sugar in distilled water is employed, while to correct the reaction of the milk one-sixteenth part of lime-water is found sufficient. The laboratory contains a large sterilizer, in which the milk can be exposed to higher or lower temperature as desired. With these stable materials available for food combinations, it is possible for the physician to write prescriptions for sugar and albuminoid percentages according to need. The figures of the percentages in average breast milk—viz: 4–7–1½—being borne in mind as a standard."

In the practical use of the laboratory the food is prepared and distributed in sterilized bottles, with all precautions to prevent possible infection in any way. The cost of the food is very moderate, and its freshness, purity, and definite composition assured. It is to be hoped that simi-

lar laboratories may be established elsewhere, as the Boston experiment has shown the plan to be commercially feasible, while furnishing a product almost ideal in its chemical imitation of human milk, eliminating most of the difficulties and dangers connected with the use of cow's milk.

In the absence of such opportunities for obtaining a pure, sterile and accurately-adjusted infant's food, the Meig's mixture remains the most available substitute. The ordinary milk supplies of our nurseries are so uncertain in character and source, and the possibilities of contamination so many, both before and after the milk reaches the home, that success in the use of the food depends on scrupulous care in correcting and avoiding possible sources of infection. To this end definite written instructions should be given to the mothers, with all attention to details. As pure and wholesome a milk as possible should be obtained, with investigation of the dairy hygiene and the cleanliness of vessels used in the transportation of milk, if possible. The milk should be received in a thoroughly cleansed pitcher, and the cream mixture at once prepared in quantity sufficient for the twenty-four hours, a large glass graduate being convenient for the purpose. The amount for each feeding is then placed in a separate bottle, using a glass funnel, so that the necks shall by kept dry, and the bottles then stoppered with a firm wad of absorbent cotton, and kept on ice. In warm weather, or when there is uncertainty as to the milk keeping, this food should be Pasteurized in the separate bottles as soon as prepared. The bottles from the Arnold sterilizer are a convenient form to use, being easily cleansed and conveniently graduated. When empty, bottles should be cleansed at once, first with cool and then with hot water. The nipples used should be of conical form, so that they can be turned and thoroughly cleansed, and when not in use should be kept in borax water.

Observance of rules as to the quantity of food desirable

at each feeding, and at various ages, with the proper interval between feedings, is of as great importance as the careful preparation of the food itself. The accurate post-mortem measurements of Dr. Holt*, and the investigations of Dr. Rotch and others, determining by weighing experiments the average amount of food taken by the nursing infant, give us definite and correct ideas on the subject, which may be formulated as follows: During the first week of life one ounce of the cream food should be given, at intervals of two hours; from the second to the fourth week one and a half ounces at each meal and at two-hour intervals; from the second to the third months three ounces are needed every three hours; up to the end of the fifth month, from four to four and a half ounces; at the sixth month five ounces; at the eighth month six ounces; while at the tenth month the quantity will vary from eight to ten ounces.

A point in connection with the feeding of infants, which deserves note, because often forgotten, and of which mothers need to be reminded, is the necessity of giving infants water to drink in addition to that which they receive with their milk. A supply of boiled water should be prepared freshly each day, and the infant should occasionally be given a drink in small quantity.

In conclusion, the artificial food of the manufacturers may be referred to. They, perhaps, fill a certain place in the dietetics of later childhood, but previous to the time of weaning, the cream food, Pasteurized when necessary, fulfills all ordinary requirements.

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*Arch. Pediat., December, 1890.

INFANT FEEDING.

By C. F. Dutton, M. D., Cleveland, Ohio

Professor of Principles and Practice of Medicine, Medical Department of the University of Wooster.

The topic assigned me by our worthy President has been so fully and frequently discussed, both in journals and medical societies, that it seems almost needless to occupy our time with it here. I promise you, at the outset, that I am able to present nothing new upon it. The fact remains, however, that the mortality of infants is fearfully great. It is also undeniable that improper feeding has largely to do with this tremendous death rate. That over forty-eight per cent of the deaths in community are of children under five years of age, and one-half of these children under one year, is a sad reflection on the knowledge of the doctors with regard to the preservation of infant life, or else of their ability to impress that knowledge on the minds of those who have the rearing of children. I shall only attempt, therefore, to emphasize a few principles with regard to infant feeding, in order that we may keep the matter more fully in mind, and give it a larger place in our thought and work than some of us have done heretofore. Were I asked why babies so frequently die and other young animals so seldom, my reply would be *mainly* because babies are *so often improperly* fed, which is seldom true of the young of others than the human species. Man's higher intelligence enables him more skillfully to violate law, and this violation of law brings upon him the penalty of loss of, or feebleness in, his offspring. Until the time for weaning, the child should be fed absolutely on its mother's milk. This is its natural

food, and when the mother is healthy, contains all the child needs. Salts, fats, sugars, albumens and water are all found in the mother's milk in exact proportion to infant needs, and nowhere else have they so far, by scientist or *commercial dealer*, been reproduced with anything like reasonable exactness. Even though the milk of the mother be of inferior quality, in general it will better nourish her offspring than any artificial food can. Except then, in cases of absolute necessity, it should be considered *criminal* for mothers to refuse, as very many do, to nurse their children during early infancy. When, however, she can not do this, human milk, if possible, should be obtained from some other source, and a wet nurse should be forthcoming. Too often, however, this is impracticable, and resort must be had to artificial feeding. Artificial feeding will be *artificial* under any conditions. No chemical analysis or synthesis ever has, or ever will, enable one to construct an artificial milk having the properties, even though it have the chemical elements, of the natural milk. As well might one undertake to manufacture a potato by a combination of its chemical elements of starch, sugar, salts, fat, nitrogen and water. Unite these elements in any manner he will and mold them into potato shape, still he will not have his potato. Charcoal and the diamond are chemically the same, but somehow they are marvelously different. So, wide is the difference between mother's milk, wrought in the laboratory of her own breasts, and these chemically scientific but physiologically abominable compounds which are continually flooding the market under the name of infants' food. There can be no question that these foods are largely responsible for much of the unnatural feebleness of infancy, for rachitic and other diseased children, as well as for the untimely deaths of many of them. For this condition of things the doctors are perhaps more than any others responsible. It belongs to them who have in the majority of cases recommended these numerous foods, to see to their early banishment. Next to milk in value as

food is that which is more like it than any other artificial foods can be, namely, cow's milk. Cow's milk can be had everywhere, and with little thought and care may be prepared in such way as to become nearly, if not quite, identical with human milk. Fed in proper quantity, fresh cow's milk in its natural state is a far better substitute for the mother's milk than any other food. Its too great richness in albuminoids and its slight acidity may be corrected by the addition of a little lime-water, and its lack, when so diluted, of fat and sugar, compensated by the addition of cream and sugar of milk. City milk seldom needs dilution. It may better be prepared by using a little bicarbonate of potash or soda, with cream and sugar of milk added. The use of condensed milk of good quality is permissable only when milk directly from the cow can not be had. It is superior to the manufactured foods, and for a limited time may be used to great advantage. Experience has shown, however, that it can not take the place of fresh milk.

A word now as to sterilizing milk. This is only required in hot weather, or when, from any cause, the milk is impure, or in cases of existing bowel troubles. Even then it is not always advisable, for I believe it is conceded that, owing to the hardening of the albuminoids by cooking, the milk is less easily digested. If perfect cleanliness with regard to food and the utensils in which it is kept is observed, there will be no need for sterilization. When sterilization becomes necessary there is no need for having at hand elaborate apparatus. The milk may be scalded or heated nearly to the boiling point in a common porcelain vessel, poured into bottles and well-corked, and so kept for use, or what, perhaps, is better, put into stout open-necked bottles, subjected to steam for fifteen to twenty minutes, then well-corked, and kept ready for use when wanted. Much has been said and written of the benefit of using peptonized milk. If the child be very feeble, and the stomach and pancreas, as is the case in some instances, in-

capable of furnishing their natural secretions, it is well enough to use predigested foods, but only as a make-shift for a little while. It is better to diminish the amount of albuminoids in the food, for a time, than to resort to the unnatural plan of giving peptonized or pancreatized foods. The only benefit in their use is that, in this way, the stomach rests for a little to regain its tone. Experience has amply shown that the continued use of peptonized foods has not contributed to healthy digestion. Natural secretion of the digestive juices will not go on in the presence of already digested food. The popular idea, that a child fed on milk must have milk from one cow is a fallacy. Milk from one cow varies much in quality from day to day. It may be excellent or poor, while mixed milk, or the mingled milk from any one-half dozen or dozen cows, will always average well, and for this reason is greatly to be preferred. The milk-man, therefore, should never be instructed to furnish only one cow's milk, but he should be requested to deliver the milk in a small vessel furnished and kept clean by the purchaser. Milk is often poisoned by tyrotoxicon or other ptomaines formed in the large cans from which the milk is delivered, through the carelessness or neglect of those whose business it is to see that they are kept clean. For this reason, if for no other, the milk for children's use should be delivered in separate bottles or cans, which have been thoroughly sterilized and alternately exchanged as the milk is delivered. The *quantity* of milk needed by an infant, of course, will vary with its size, age, and vigor, and no definite rule can be laid down as to just how much shall make up its allowance. The same is true with regard to the frequency of feeding. From one to two ounces is the ordinary amount needed from the first to the sixth or seventh week, and as often as every two hours through the day, and three or four hours during the night. After this, the quantity may be gradually increased to three or four ounces at a feed, up to the sixth month, at intervals of two and a half to three hours during the day, and four

or five hours at night, and so on, increasing the quantity until the tenth or twelfth month, it may be six to eight ounces at one feeding, the intervals being three to five hours, and allowing not more than once during the night. Much harm comes from over-feeding. Regularity as to time should be scrupulously observed, and the amount given only so much as may be digested and appropriated. So long as the child thrives, does not vomit, and has no diarrhea, the quantity can not be far out of the way. Infants, like adults, should take their nourishment slowly. In case they are bottle-fed, the orifice of the rubber nipple should be very small. In sickness or great feebleness, the amount of food will, of course, be proportionately diminished. The mother who is in good health should nurse the child until the ninth, tenth or twelfth month, and no other food should be given. After that, it may be thickened a little with oatmeal, but *no solid food should be given a child until it has solid teeth.* I would like to emphasize this, and lay it down as a fundamental law. The only object of feeding an infant is, that the child may be nourished; and another fundamental law is that no food should ever be allowed a child that will not nourish it. It is not a question whether this or that will do harm, but whether it will do good. Fruits, confections, and so-called relishes, children never need. It seems puerile to mention this, but my apology for it is that *mothers and nurses* and, I may say, *foolish fathers*, are constantly doing it. Limited in time to ten minutes, I have omitted reference to so-called authorities in infant matters, nor have I thought best to enter into the analysis of milks, or other infant foods. I simply refer you to existing tables, to be found in all your libraries.

In closing, let me call your attention to the necessity, in practice, of giving to mothers and nurses such instruction as may by them be carried out, remembering that with *them* what seems to us simple may be impracticable, if not impossible.

INFANT FEEDING.

By B. B. Loughead, M. D., Akron.

Thinking there would be great danger of four of us speaking on the same line concerning the subject under discussion, I have, therefore, decided to present before the Society some demonstrations concerning the composition of the infant foods upon the market, knowing the scientific side would be presented by the other gentlemen discussing the subject.

If all mothers were able and willing to nurse their offspring, our Summer occupation would be largely gone. The ever-increasing number of mothers who can not, or do not, nurse their children, affords us each year a large *clientele* of artificially-fed babies, who languish and die, or languish and almost die, when tried by the heat of Summer and the irritation of teething.

The feeding of this large number of infants, that are deprived of their natural nourishment, has not received the attention of the profession that its importance demands. We have been very busy discussing and devising means to combat the pernicious effect of inappropriate food upon the lives of our little patients, instead of saving them from this effect, by thoroughly instructing parents and nurses in the best methods of feeding the infants in their care.

If the medical profession had done its whole duty to these motherless little ones, and had provided suitable food for them, the score or more of manufactured foods that have been put upon the market, by parties that have no knowledge of the physiology and chemistry of infant

digestion, would never have been made. These foods are a purely commercial enterprise, a liberal patronage being reasonably assured by a free use of printers' ink. The enterprising but unscrupulous manufacturers of these foods claim for them all of the qualities of mother's milk, ignoring entirely the fact that the digestive organs of an infant differ materially from the digestive organs of later years.

Until the completion of the second or third month of infantile life, the salivary glands are inactive; there are no teeth often until the end of the first year — seldom before the sixth month; the hard palate is undeveloped; in short, the mouth of the infant is fitted for the transmission of fluids, but takes no part either in the preparation of food for digestion, or in the digestive act.

The stomach of the infant is small, dilated in the center, and much nearer horizontal with the body than in later years. The liver is relatively large as compared with other organs; the pancreatic secretion has no diastatic action until the child is a number of months old, and but feeble action upon starch until the close of the first year; and the intestinal peristalsis is rapid, the food being hurried along through the intestinal canal.

These anatomical and physiological conditions demand: That the infant's food be fluid; that it be easily digested; that it be of a quality to be rapidly absorbed, and that it contain no starch. The absence of ptyalin in the mouth and in the intestinal secretions renders the conversion of starch into digestible sugar impossible, and starch taken into the stomach in early infancy is not appropriated by the economy, but is a fruitful source of fermentative action, a culture for the propagation of bacteria, and a constant menace to the life and health of the child.

The unchanged condition of starch in the alimentary canal has often been demonstrated by post-mortem. It was at one time the routine practice in the hospitals of Paris to feed all infants that were indisposed upon a decoction made by boiling together arrow-root and rice. The

excessive mortality of these infants led to an examination of the intestinal contents of a number of infants that died while using this food. The report says: A striking and uniform similarity of the contents of the intestines was found; a jelly-like substance being present, and in some instances lining both the small and large intestine. This substance was subjected to the iodine test and found to contain starch.

In utter disregard of the inability of young infants to digest starch, a very large number of the so-called "Infant Foods," upon which thousands of children are being fed, are simply ground cereals, with perhaps a small admixture of milk sugar.

I have in these test tubes samples of ten different infant foods. They are not selected, but are the foods most called for in this part of the State.

In the first tube I have some powdered starch, which I dissolve by the addition of hot water. A few drops of the tincture of iodine being added, an intense blue color is produced—the characteristic reaction when free iodine is added to a solution containing starch. This gives us a basis for comparison.

The first sample of food to be tested is one that, at this present time, is being advertised in the daily press of Northern Ohio. The advertisement is embellished with the pictures of a number of healthy children. You see by the test that the stuff is wholly unfit for the purpose for which it is sold. (Here follow tests.)

The most of the foods, as you see, contain starch. They are probably oatmeal, barley meal, etc., and are worth from three cents to four cents per pound, if sold for what they really are. Put up as "Baby Food" they bring from forty cents to sixty cents per pound. It does not follow, because a food does not contain starch, that it is fitted for infant feeding. These foods are being pushed by such alluring advertisements that a mother might well question whether it would not be better for her child to wean it and use this or that artificial food, instead of breast milk.

Gentlemen, I do not believe this Society could do a better work than to call the attention of our State Food Commission to the fact that there is being sold within our State, many articles, as food for infants, that are not digestible by infants, and that their use must necessarily bring about sickness, and in very many instances the death of young infants that are fed upon them. It might be sufficient to condemn these foods that their composition is secret, and the sale of a secret food ought to be prohibited upon general principles. If we can not secure a hearing and action by the Food Commissioner, then we can carry our case before the State Board of Health, and have the subject investigated by men who understand the physiology and chemistry of digestion.

When we consider that these foods are quite largely used, often being recommended by physicians who have never investigated their composition, or who have not kept in mind the peculiarities of infant digestion, the mortality among artificially-fed babies may be readily understood. About one-fifth of all the deaths among children under two years of age is caused by digestive troubles. A very large per cent of these deaths are bottle-fed babies. The deaths amount to many thousands annually. The sickness and mortality among this class of infants would be materially decreased if an appropriate and easily-digested food were fed them from the start.

In what, then, must an artificial food consist, to afford the infant appropriate nourishment, be easily digested, quickly absorbed, and contain no deleterious or indigestible substance. In an essay written by a German physician, under the title "The Normal Digestion of Infants," he gives the results of microscopical and chemical examination of the fæces of a number of healthy infants, from two to three months old, whose diet consisted wholly of breast milk. He found: 1. That all of the caseine was absorbed; 2. That nearly all the sugar is appropriated; and, 3. That a large part of the fats was used by economy. In an artifi-

cial food, these three ingredients should sustain as nearly as possible the same relation to each other, in quantity and quality, that exists in breast milk. Asses' milk approximates more perfectly human milk than the milk of any other animal. But asses' milk can not be secured in sufficient quantity to be considered as a substitute. Our best substitute for human milk, all things considered, is cow's milk. When it can be obtained, the milk of a number of cows is better, for reasons which will readily occur to you, than the milk of a single cow. Cow's milk contains about four parts more of solids to the 100 parts than human milk; and as the ratio of solids is as twelve to eight, about one-half to one-fourth water, according to the age of the infant, should be added to the milk.

The caseine of cow's milk forms a hard, coarse curd, and is only about three-fourths digested by the juices of the stomach. In human milk, the curd formed in digestion is light, flocculent, and entirely digested. In order to overcome these greatest objections to cow's milk, various methods have been resorted to. The best method is, undoubtedly, a partial predigestion, in the home, by the use of artificial digestives. The method of predigestion that has served me well, and that I have found no difficulty in getting mothers to adopt, is as follows: A quart bottle and a porcelain-lined kettle are the only utensils that are necessary. Into this clean bottle, one-half pint of fresh cow's milk is put, and such a quantity of warm water as may seem best in the particular case is added to the milk. Cream may be added if the milk is deficient in fats. To this milk, thus prepared, is added a mixture of pepsin and pancreatin rubbed up with milk-sugar, and dissolved in a little warm water. The bottle is well-shaken, and placed in a vessel of warm water, that is kept at a temperature of 115° F., for thirty minutes. It is then poured into the clean porcelain kettle, and brought quickly to the boiling point. This stops further digestion, and the milk may be bottled and set in a cool place. Where milk can not be obtained until

it has been carried for miles through the hot sun, and not delivered until hours after it is milked, condensed milk offers the best substitute. Condensed milk is cow's milk evaporated to one-fifth the quantity, milk-sugar added, and canned while hot.

I believe, Gentlemen, that the process here outlined, if faithfully followed, will save, each year, thousands of lives, and untold suffering among the little ones. This feeding should commence as soon as it is found that the mother can not nurse her little one, and not wait until the digestion is weakened by improper food, or the child's life is imperiled by sickness produced by some one of the abominable foods forced upon the parents' attention by lying advertisements.

DISCUSSION.

DR. H. J. HERRICK.

Mr. President—I presume that no paper on any subject will come before this body of more interest to humanity than this. It, therefore, is only right for us to stop and further explore, and give time for a thought regarding it. I quite agree with the positions generally taken by those who have this morning presented views on this subject. I take them, however, with some little honest inquiry with regard to some of the points taken, and would suggest some agents that have been valuable in my experience. In the first place, my friend, Dr. Cushing, in the paper advocates the administration of a certain amount of lime water to prevent fermentative changes. I know that is a common custom. Authors universally, perhaps, commend lime water. Is it good practice? Is it sensible practice? Milk must undergo digestion. This requires gastric juice (which contains hydrochloric acid) and the other juices. Lime water given to an adult will even positively produce dyspepsia and disturbances of digestion. If, in a case of enteritis or gastro-enteritis, you administer lime water, you will cause trouble. In my early practice I found bad results following the administration of lime water. I would raise the question, whether, from a physiological point of view, it is sensible practice to administer lime water with

milk? I do not use it. Where alkalies are required, a weak solution of soda bircarbonate or prepared chalk, in my experience, is preferable. Another point I wish to call attention to is the question of articles of food as prepared. I am not quite certain with regard to the reaction of iodine upon dextrine. If the temperature of starch is raised to a certain degree, it is not starch, but dextrine, and dextrine is more easily digested than starch. Many of the infant foods are glucose and dextrine combined, and may constitute very favorable articles of food where digestion is feeble. Desiccated malt is, undoubtedly, one of the forms sold freely on the market. Neither of them are appropriate substitutes for nature's delicately-adjusted food for the delicate organs of the young child. I have found a valuable substitute for mother's milk in the condensed milk furnished.

The Eagle brand I have found of great value, and much superior to the milk ordinarily supplied by the milk dealers in the city. We are perfectly aware that there are ladies who can not nurse their children, and in these cases you are compelled to secure a substitute for the mother's milk. You say, "Secure a wet nurse;" but then you are almost certain to have a tumult on hand, and perhaps will secure defective milk. I had a case this Spring in a family, in a healthy portion of the city, where the mother was unable to nurse her child, and I advised the selection of a goat. A fresh goat was secured, and the milk was drawn, diluted, and prepared as required. I am not now able to give you the analysis of the goat's milk as compared with mother's. On this food the child grew, gained in flesh and maintained as perfect condition of health as possible. I commend this as a substitute for the mother's milk. I think in this we have a valuable agent for infant feeding, and one that can easily be provided.

Another point is the constant administration of drugs for the diarrheas in children — cholera infantum. I think they positively do harm as a rule. There may be exceptions. The one other point is the importance of abstinence from food. Many times children suffer from intestinal trouble who are well nourished, over-fed, and it then does the child good, often, to have a little rest of stomach, say twenty-four hours, during which time there may be administered a little pure water, with perhaps a grain of salt. The dear mother sometimes fears the child will suffer for want of food, and a little pure water is a very efficient

means of quieting and promoting healthy secretions. You only need to assist nature; water I regard of value.

DR. COMEGYS:

Mr. President—I think there is another acid, for which the lime water is an antidote, and it is certainly available in the feeding of children. I refer to lactic acid, an acid of degeneration. If you neutralize the gastric acid, you will do harm; but, if you neutralize the lactic acid, which is depressing, you will do good, and, therefore, I will not exclude the use of lime water, as does my friend who preceded me. I think the cow's milk is what we can rely upon, and, if properly administered, there is no better food for infants. It seems to me we must look to the pathology of "Summer" complaint. I have heard no one speak of catarrh, gastric catarrh, or gastro-intestinal catarrh. This seems to me important as causal in the indigestion of infants. We should consider the capillary system connected with the stomach and intestines, for a hyperemia there is productive of an increased secretion of mucous, which is more unstable than that which is normal, and undergoes decomposition into ptomaines, depressing the functions of the nasal nerves. We must do something to inervate them, and for this purpose I have found nothing equal to strychnine, or the tincture of nux vomica, which act on the nerve centers. The difficulty lies in the capillary system. The effect of the remedy is a restoration of the paresed nervous function and a suppression of the excessive mucous. Now, take gastric secretion, gastric catarrh of the adult; it seems to me I could cure a million cases of it with strychnine and bismuth. Nux vomica is best given to infants; but strychnine to adults. These go to the nerve centers, whose function is to maintain the capillary system. This is the theory I act upon in my practice. In cases where the mother's supplies fail early, and the infant is in danger from inanition, I have found nothing better than a careful feeding with cream and brandy, until the infant begins to improve; then I direct equal parts of milk and cream, and still use a small quantity of brandy, and minute doses of tincture mur. iron and bismuth as long as seems to be needed for the cure of the gastro-intestinal catarrh.

I believe this is one of the most important subjects which will come before the Society at this session, for we

know that one-half of the children in cities die under one year of age, and nearly all of these cases originate in disturbances of the digestive system.

DR. AYRES:

I would like to ask Dr. Loughead if he examined any condensed milk.

DR. LOUGHEAD:

No.

DR. E. SINNETT.

I only want to suggest one idea, which has not been brought forward. That is, the importance of ascertaining from the parents the amount of food they feed their infants. That is one of the most essential points. As has been remarked, this subject is of exceeding importance. I can only mention a few instances, which have come under my observation, to show the importance of finding out the quantity of cow's milk, and other food, administered. Frequently, the parents do not follow the directions given by the physician, but are rather guided by the instinct of the little sufferer. It cries and worries, and they will give it a little milk; and if it cries and worries a little more, they will add to the quantity of milk, notwithstanding the repeated paroxysms of vomiting. This matter should be insisted upon. In the case of one little infant, about two or three months of age, which was being fed on cow's milk, the mother was giving three pints daily. In another instance, of an infant several months older, the mother came to me once or twice for a prescription, and, on inquiry, I found she was giving it six or eight crackers a day; at least, such was her statement. It is very necessary these points should be fully ferreted out and corrected.

TREATMENT OF INITIAL CASES OF CLUB-FOOT.

BY WM. E. WIRT, A. M., M. D., PH. D.

Professor of Orthopedic Surgery in the Medical Department University of Wooster, Cleveland, Ohio; Visiting Surgeon to University Hospital; Orthopedic Surgeon to Cleveland Hospital for Women and Children; Chairman of Committee on Defective Classes of the Ohio State Association of Charities and Correction; Honorary Member of Northern Ohio State Association; Fellow of the American Academy of Medicine, etc.

The first question of importance that arises in the discussion of this subject is, when shall treatment be begun in a child born with a club-foot? I am asked this question very frequently. My answer is: Begin the treatment as soon as possible, *i. e.*, as soon as the child nurses properly, and there are no important digestive disturbances. The importance of beginning early treatment lies in the fact that the foot grows more rapidly at this time that at any other, and also that the bones, while cartilaginous at birth, will soon be osseous, and the deformity will then be much harder to correct. The treatment required in most of these infantile cases is mechanical, while in a few, operative measures seem indicated.

At this early period much can be done by the hand. Several cases of cure by the hand alone, in mild grades of club-foot, have been reported. But this measure should be looked upon as an aid, and somewhat in the light of massage, to keep up nutrition and strength of the part, rather than as curative in itself.

In the way of mechanical measures we have many kinds of braces and several forms of bandages. Of the large number of braces that have been devised, many, if not most of them, can be examined with interest only from an

historical stand point. The tendency at present is toward extreme simplicity in the make of braces. Orthopedic surgeons, who still devise complicated braces, with many screws, buckles, straps, etc., belong to a past age. Of the several forms of bandages, plaster-of-paris undoubtedly holds first place. Schreiber, in his work on Orthopedic Surgery, says: "In the new born, of course, it can not be a question of complicated apparatus and bandages." And further on, he says: "The objection to the plaster bandage, that it interferes with active and passive movements, does not hold, for the bandage is changed every eight to fourteen days, when an opportunity is given for bettering the position of the foot by passive manipulations." Edmond Owens, F. R. C. S., in his work on Surgical Diseases of Children, says, in speaking of this subject: "After the foot has been for about half an hour in the strained position insured by the plaster, discomfort seems to have worn off. It is not so, however, when a child is being treated by a Scarpa's shoe. In that case the improvement is obtained chiefly through the localized pressure of narrow straps — a pressure which creates a constant irritation, and which, causing a chafe or sore, demands a vexatious discontinuance of treatment. With the gypsum bandage, the pressure is evenly distributed over the foot in the corrected position, and with due care no sore should occur. * * * * The plaster-of-paris method enables one to treat the club-foot of a tender infant with security and success, and without the expense of a mechanical apparatus requiring daily attention." Bradford and Lovett speak favorably of gypsum in this connection. At the Hospital for Ruptured and Crippled, children in arms are treated by this method, the bandage being changed every two weeks. In private practice, where it may be desired to push the treatment, and where instructions are more fully carried out, the bandage may be changed twice a week. And here is where massage and shaping the foot by the hand may be made effective. Between the time of

removing the plaster from a club-foot and the application of a new bandage, several hours or even a day may be allowed to elapse, and during this time active massage and the shaping of the foot by the hand should be frequently carried out. This massage improves the nutrition, keeps up the muscular development, and aids greatly in the cure of the deformity. By this method, children born with extreme club-foot, where the inside of foot lay against the tibia, I have seen so far improved in four to six months that the foot could be brought to nearly the normal position with but little force and without apparent discomfort to the child. In the infantile cases, the shortened muscles are but a weak resistance, and their division at this early age is not especially to be recommended, nor is it ordinarily required, except in a few of the worst cases. But when the child is old enough to walk, the deformity should be so far overcome that the patient is permitted to walk on the soles of his feet, and should this not have been accomplished by mechanical means, then an operation for the complete correction of the deformity is demanded before permitting ambulation. The cutting of the fascia in the sole of the foot and the section of the tendo Achillis is all that is required in these cases to complete the correction of deformity. But the child will need a retentive apparatus, to be worn for probably two or more years; this retentive appliance is the walking brace inside the shoe. The most satisfactory inside walking brace is the one devised by Taylor, of New York.

I would call attention to the fact that the brace is simply a retentive apparatus, being applied after the deformity is corrected by other means. It is true that Dr. Taylor has permanently cured several moderately severe forms of club-foot by the use of the brace alone, but the method requires considerable skill, much time, and great persistency. This leads me to enter a strenuous protest against the indiscriminate sending of club-feet to brace-makers, usually leaving the entire treatment in their hands.

Cure by them is very unusual, even in the mild cases, and in severe cases it is out of the question. The brace-makers in Cleveland and elsewhere nearly all use braces attached to the outside of the shoe. Many of these outside braces do not in any way tend to overcome the equinos deformity, and for the cure of the varus deformity depend on the rigidity of the leather. In a new shoe, for a few weeks, it holds the foot in fairly good position, but before the shoe is one-third worn out it has become warped, allowing the foot to return to its old position. Further than this, when the shoe is worn out, the patient requires a new brace, while with a brace having a metal sole plate, and worn inside, it can be used until any number of shoes are worn out.

The time during which treatment must be continued varies somewhat. Infantile cases require the foot to be maintained in a corrected position for a matter of two, three, or more years, before the tendency to relapse disappears. In older children, though it is harder to get the feet into a normal position, yet, when this is accomplished, they require to be thus held a much shorter time. A girl, eleven years old, for whom I corrected the deformity by an operation, was only obliged to wear braces four months, finding that the cure was permanent by that time. As a remnant, left after a thorough treatment of club-foot, we may have a condition existing known as "pigeon toe." This impediment often exists only as a primary condition, *i. e.*, the child having no other evidence of deformity, and when thus existing may be recognized as the mildest form of talipes. It is often very difficult to cure. Building up the outside of the front of the shoe (not the heel) is often quite successful in correcting the deformity. Braces attached to the feet, and passing upward to a pelvic band with a coil-spring, acting to rotate the feet outward, has been used with success. Within the last two years, Dr. William Barton Hopkins, of Philadelphia, has devised a heel-plate, which he claims is quite

successful in the cure of pigeon-toe. It consists of a swivel, with incline planes working on rollers, and acted upon by a spring. The weight of the child on its heel forces the toes outward, the rollers running down the incline planes; on raising the heel the spring forces the plate back to its original position, and it is ready for the next step. Dr. H. Augustus Wilson, of Philadelphia, also spoke well of this brace at the last meeting of the American Orthopedic Association, which was held in New York City, in September, 1892.

DISCUSSION.

DR. FANN.

Mr. President—I would like to ask, in such cases as are fit for treatment by plaster of paris, in what manner will you keep the foot in position until after the plaster sets? I ask this either of the reader of the paper or any member. In pigeon-toes, is the development due to the plantar fascia?

DR. WIRT.

Mr. President — Speaking of the position in which to hold the foot, I would say that the child's foot, with the assistance of a nurse, is twisted, rotated outward, and at the same time flexed, rotating it as far as the child will stand it without a great deal of crying. Now, the question comes up as to how far to twist the foot. The child will naturally cry, and, of course, the amount is a matter of judgment. If you put the plaster of paris on the foot with no wrinkles, and the proper amount of cotton underneath it, the child will stop crying within ten minutes, probably within five minutes. The parents, seeing the child cry, will probably object, but if you can assure them the child will stop crying within ten minutes, it is of value. But should your judgment be at fault, and the child not stop crying within ten minutes, you had probably better take it off.

With regard to the plantar fascia in pigeon-toe, we do not usually find this very much contracted. Pigeon-toe is really, I think, the first grade of club-foot. The first

degree is turning in of the foot, and there are all grades, up to the condition where the patient walks on the back of the foot. The first evidence, therefore, of a tendency to club-foot, is a simple turning in, or a simple pigeon-toe. But a great many children have that condition, and if you call it club-foot the parents would feel grieved, and, ordinarily, I would not use that term. In these cases, I do not think there is much contraction of the fascia; at least, it is never cut.

Now, in the treatment of club-foot, and also other conditions, as bow-legs and knock-knees, there is a treatment by Lorenz I would like to call your attention to. Dr. Lorenz, of Vienna, Austria, has devised an apparatus for bow-legs and knock-knees, by which he applies a three-point pressure. The middle pressure is a rubber band, and by means of levers he gradually throws the leg into a straight position. He has found that if you continue pressure for a half-hour you can bring the leg over, and it becomes quite flexible, where, by osteotomy, you would have found bone like stone. As you all know, in rickets, you get bow-legs, and the bone hardens very much. Yet, in these cases, the bone will come over very gradually within half an hour. He accounts for this by claiming the molecules of the bone readjust themselves. It certainly seems unique, and is very satisfactory, for you can tell the parents that you will straighten the leg without breaking it. In a few cases he gets fracture, but he usually cures even the worst cases without fracture. He puts the leg in position immediately after being straightened, and applies plaster of paris, and in a week or ten days the child can run around.

THE MANAGEMENT OF FOREIGN BODIES IN THE AIR-PASSAGES.

By Max Thorner, A. M., M. D., Cincinnati, Ohio.

In considering the question as to the management of foreign bodies in the air-passages, I think I may safely omit lengthy excursions into the literature of the subject. It is certainly interesting from a historical standpoint to study what the ancients, beginning with Hippocrates, the *divus pater medicinae*, had to say on this subject; or what reference we might find in the writings of the medieval authors, or the writers of more modern times. But for practical reasons, and especially from a feeling of due consideration for the rights of other essayists, it is probably best to simply consider the question from our present knowledge of the subject; that is, to investigate what does the experience of to-day, with the present methods of examination and operative procedures, teach us to be the most rational plan of dealing with foreign bodies in the air-passages. For this reason, therefore, I shall also not enter into an enumeration of all the extraneous substances that have found their way into the air-passages, further than to say that anything from a shoe button to a five-dollar gold piece may be found in the respiratory tract; and I shall, for like reasons, omit references to the various exigencies that permitted these foreign bodies to lodge in the air-passages. Let us simply suppose that we have to deal with the fact, that a foreign body is somewhere lodged in the air-passages.

It is obvious that such a foreign body ought to be removed as soon as possible. The presence of a foreign body anywhere in the respiratory tract constitutes a danger, immediate or remote, to the life of the patient. This danger, certainly, varies in degree according to the location, size or nature of the foreign body. While it is very slight and generally remote in cases where the foreign body is in the nose, the post-nasal space, or the pharynx, it increases rapidly in gravity whenever the foreign body has invaded the deeper parts, and commences to embarrass the respiratory function either directly, by obstructing the air-passages, or indirectly, by pressing upon the soft posterior wall of the windpipe from within the oesophagus. We must, therefore, look upon the presence of a foreign body in the deeper air-passages as a constant menace to the life of the patient, notwithstanding the well-recorded fact that occasionally foreign bodies were lodged for a long time in the air-passages, yet did not create any serious disturbance; or where they were expelled, after a shorter or longer term, by nature's own efforts. Such cases are simply exceptions. The number of cases is much larger where the most serious results followed the entrance into the air-passages of extraneous substances when the expectant method prevailed. I shall not tire you with statistics made up by various compilators regarding the question of interference or non-interference in such cases. But I may state that ample experience has shown the mortality to be much greater (in fact, again as great) in cases where the foreign body was not removed, than in the cases where operations were undertaken for the relief of the patient. *Laissez aller* is a dangerous maxim in these cases; many a life might have been saved by a timely operation.

I shall briefly relate two cases from a larger number of my own, of which the first apparently contradicts these statements, while the second confirms them.

CASE I.— Mr. W. D., æt. 35, was quietly standing at his window one Saturday afternoon, in May, 1890, when he

felt something work up in his throat. Before it could be ejected it slipped down again; he immediately experienced a feeling of suffocation, and the breathing became difficult. Dr. N. P. Dandridge, who was consulted, failed to discover anything wrong with the young man. The patient had eaten green peas with his dinner, and expressed himself as confident that a pea had slipped down the trachea. The breathing became easier for a while; but when the troublesome sensation could not be relieved, Dr. Dandridge and Dr. Wm. Carson examined the patient again, making a very thorough physical examination, without being able to locate the foreign body. Although the patient was at intervals entirely free of any annoying sensation, he still insisted that the pea was somewhere in his chest. Later on in the afternoon the patient had severe paroxysms of coughing, when Dr. C. R. Holmes was consulted, who referred the patient to me. The patient was one of those individuals in whom it is easy to inspect, with the laryngscope, the larger part of the trachea. But neither this nor repeated physical examinations, could produce a positive proof as to the presence or whereabouts of the foreign body. In fact, there seemed to be a general doubt among the physicians as to his actually having a foreign body in his air-passages. In the evening the patient was taken to the gymnasium, and hung head downward, and pounded on the back and chest, in the hope of removing the body by gravitation, but without avail. The night and Sunday were passed in great distress; the frequent paroxysms of coughing were very violent. Monday gave no relief, and Tuesday morning he felt very exhausted. The chest was so painful that he endeavored to suppress the cough as much as possible. Tuesday morning, sixty-six hours after the beginning of the trouble, he suddenly had a severe coughing paroxysm, during which he coughed up a large-sized green pea. In a few days all the above-mentioned symptoms disappeared, and he has never experienced any ill effects since.

CASE II.—Miss E. R., æt. 16, while eating soup, about two months ago, had a severe choking spell, and declared that she had swallowed a bone. She soon become dyspnoic, and physicians were sent for. When Drs. Shoemer and Schwagmeyer arrived they found the girl unconscious. There was marked dyspnea and cyanosis. Failing to discover a foreign body in the pharynx or in the upper larynx they summoned me in consultation. Upon arrival, about one hour after the accident, I found the patient lying on a sofa, unconscious, and somewhat cyanotic. She was breathing with great difficulty, the loud inspiratory noise being audible all over the room. The pulse was small, indistinct, and very rapid. During inspiration, the jugular and epigastric regions were deeply retracted. A laryngoscopic examination could be made with the greatest difficulty only, on account of the comatose condition of the patient. However, I was enabled to determine that there was no foreign body in the larynx, but thought to have twice seen a whitish substance below the vocal cords, without, however, being absolutely sure of it. It may be added, that the father of the girl, a very sensible man, had some doubts about his daughter actually having a foreign body in her throat, since she had had choking spells of a hysterical order before, though of less severity. After a brief consultation, immediate tracheotomy was decided upon, as the patient was rapidly sinking. Accordingly, the high tracheotomy was done. I selected this instead of the low operation, because the surgeon is able to do it in much less time, which is of importance when death from suffocation is impending; and, secondly, because an opening in the upper tracheal rings is more adapted to the removal of a foreign body lodged in the subglottic space than the opening afforded by the lower tracheotomy. No attempt was made at the time of the operation to find the foreign body, as the patient was almost apnoic. But within a few days, I began the search for the foreign body, and found it im-

pacted in the space above the wound channel. In the presence of the physicians who had seen the case with me, I removed, with a small pair of curved forceps, a quadrangular piece of bone, of about the size of a five-cent piece, through the tracheal opening, from the subglottic space, where it had been held firmly impacted by its rough edges. The patient, after the removal of the foreign body, made a quick and uninterrupted recovery.

If we analyze these two cases, we may arrive at the conclusion that, in the first case, tracheotomy would not have been called for, for two reasons: firstly, because there was some doubt of the pea having actually entered the air-passages; secondly, because the patient recovered spontaneously; while in the second case, the threatening symptoms demanded, and the recovery of the foreign body justified, the operation. Now, after a number of years have passed since the first case made the spontaneous recovery, I must confess that I am at present of the opinion that I ought to have recommended tracheotomy in the first case also. That the foreign body would be spontaneously expelled is a fact that could not be anticipated; it is certainly the exception, and our therapeutical measures ought not to be guided by exceptions. The proportion of cases where patients under similar conditions perish, without operation, is much larger than where an operation is performed. Some authors place this proportion of mortality as about two to one. I recollect a case, from the practice of a colleague, which illustrates this point, and which I may be permitted to briefly mention, as it never has been published. A vigorous young man was unfortunate enough to draw into his windpipe a dried white bean, which he held, playfully, in his mouth. After a severe coughing paroxysm, the patient had a sensation of pressure below the sternum. A physician was consulted, who, after a thorough examination, proposed tracheotomy. This was refused, even when, after periods of temporary relief, excessive cough and difficult breathing returned at short in-

tervals. The patient died, about four months after the accident, of pneumonia. It is reasonable to suppose that, by an early tracheotomy, the foreign body might have been removed, or its expulsion facilitated. And while I am far from asserting that all cases in which tracheotomy is done, will get well, I still believe that the chances are a great deal better for the patient if the operation is performed. There was also some doubt, in my second case, as to the presence of a foreign body; but the history of the case, as well as the threatening symptoms, demanded an immediate operation. And the possible failure of finding the foreign body after the operation could not have greatly militated against the necessity of the operation. If therefore, we conclude that foreign bodies ought to be removed from the air-passages in all cases, we may briefly examine the different methods.

We may safely omit from discussion such obsolete methods as, causing the patient to sneeze or to vomit, or that of succussion of the chest and back of the patient while he is put in a position with his head hanging downward. Although they may have occasionally aided the expulsion of the foreign body, they are generally futile, and, at times, even dangerous, inasmuch as often valuable time is lost with such procedures. The last named measure is also liable to cause spasm of the glottis, if the foreign body should happen to strike the lower surface of the vocal cords, or may lead to impaction of the foreign body in the subglottic region.

There remain, then, operative measures only, which are either endolaryngeal, *i. e.*, the removal of foreign bodies by instruments introduced through the mouth, or extralaryngeal, *i. e.*, the opening of the air-passages, for the purpose of relieving dysynea and of removing the foreign body. It stands to reason that we should always try to remove the foreign body from the pharynx and from the larynx by the endolaryngeal method; that, on the other hand, the extralaryngeal method is indicated in such cases where foreign

bodies have entered the trachea or bronchi; or whenever the life of the patient is in immediate danger of suffocation, when there is no time or no possibility of making attempts at endolaryngeal operations. This last indication permits, of course, of a certain latitude, as being greatly dependent upon the circumstances of the case, and the dexterity of the practitioner. That tracheotomy ought also to be performed in cases where the foreign body has entered the bronchial tubes is advised, not so much with a view of extracting the foreign body from the bronchus, as for the purpose of directly exciting paroxysms of cough, and thus to facilitate the expulsion of the foreign body through the artificial opening.

The foregoing remarks refer mainly to such cases where there is no doubt that a foreign body has actually entered the air-passages. I am, however, also of the opinion that, in doubtful cases, where there is no absolute proof of the presence of a foreign body in the air-passages, yet where there is good and sufficient reason to believe, *by circumstantial evidence, as it were*, that an extraneous substance is lodged somewhere in the air-passages, that, in such cases, we should give the patients the benefit of the doubt. And while I am far from speaking lightly of the operation of tracheotomy, I can not help thinking that, in many cases of doubt, it will help to save life.

DISCUSSION.

DR. N. P. DANDRIDGE:

One of the cases referred to by the author came first under my care, and, as the writer has stated, there was uncertainty as to whether there had been a foreign body swallowed, and lodged in the windpipe. There had been an interval of one or, possibly, two days, before I saw him, and at the time there was no difficulty of respiration, except at times some spasmodic shortness of breath. As the doctor indicated in his description, the examination was very carefully made, and all possible methods taken to find out whether there was any foreign body in the air passages,

but they were all negative. After the lapse of several days, the foreign body was coughed up. I can hardly accept the conclusions as to the necessity for tracheotomy as frequently as the essayist advises. The two cases reported by him show the different character of foreign bodies. The first was a pea, or, if I remember right, only part of a pea. A body of this character, drawn into the windpipe, would be difficult to detect, unless it could be seen. No instrument you could pass down through the trachea could detect it, the consistency being so similar to the tissues themselves. In this case the symptoms were spasmodic and recurring difficulties of breathing of varying intensity, and at no time was there any indication of the patient's life being in danger from suffocation. The second case is entirely different. The foreign body was of such a character that the exploration of the trachea, with the proper instruments, might easily have detected it, even if within the bronchi, and the shape of the body was such that it could not be easily expelled. In this case, also, there was, following soon after the accident, an alarming suffocating attack, which threatened the life of the patient. Now, under all circumstances, I think tracheotomy indicated when those symptoms are present, not because a foreign body is in the trachea, but because the patient's life depends on the rapid admission of air to the lungs. In these cases we nearly always have an idea of the character of the foreign body, or we know what it is. It may be a small coin, or, where it occurs while eating, we have some idea of the character and consistency of the body drawn into the windpipe. Where the body is such that the introduction of an instrument into the windpipe will give the impression of a foreign body, I agree with the author as to the advisability of a tracheotomy, being guided by the symptoms present. If the symptoms are such that death is impending from suffocation, the operation must be undertaken. If, however, as in the first case, there is some uncertainty of a foreign body being present, and when the character of that body is soft, and not likely to cause damage to the tissues by contact, such as a pea, I think we can usually afford to wait.

DR. C. S. HAMILTON.

In November, 1891, I was called to see a negro, upon whom a tracheotomy had been performed several years previously, for what cause I am unable to say. Since the

operation the man had worn a tracheotomy tube. It was his custom to take the tube out in order to clean it, and on this particular occasion he had been doing so. In replacing it, the tube slipped from his grasp into the tracheal wound and disappeared. Most distressing paroxysmal cough with dyspnea followed immediately. When first seen by the writer, the patient was breathing painfully and laboriously, with occasional attacks of coughing, which left him exhausted. The tracheal fistula was constantly discharging a red-colored, frothy serum. He was placed in the sitting posture, on the edge of the bed, and with the right hand tracheal forceps, bent at an angle, were inserted and passed downward. After a short preliminary search, the tube was found and seized, apparently at the beginning of the right bronchus. The forceps were then withdrawn, gradually, until the tube was brought up to the opening in the trachea, which was something less than a half-inch in length. At this juncture it became evident that the forceps had grasped the tube at a considerable distance from its upper extremity, and it was, therefore, impossible to deliver it. Hence, the forceps were changed from right to left hand, and the tracheal opening enlarged vertically until its length was about one inch. Just as the cutting was concluded the forceps slipped, during an unusually violent coughing effort, and the tube dropped back into its former position. It was necessary to repeat the exploring process, and, after much trouble, the tube was again seized and withdrawn, this time completely. The patient was immediately relieved of his distressing symptoms, and recovered very speedily. It was learned that he had once before had a similar experience, a much smaller tube slipping into the opening before it had undergone cicatricial contraction. The tube was expelled by cough a short time afterward. The one which was removed on this occasion was a common hard-rubber tube, which was broken accidentally since its removal, thus losing half an inch of its original length—three and one-quarter inches. The collar on the end of the tube has a diameter of seven-sixteenths of an inch. I report the case because it is an unusual one.

In any case of suspected foreign body in the air-passages, it seems to me that the patient should be within easy reach of a physician. In a certain number of such cases, when the foreign body is of favorable size, expulsion by cough may be expected. On the other hand, at any

moment, a paroxysm may occur which will result fatally, unless relieved at once by operation. Such a case I witnessed within the last two weeks. A child, eighteen months of age, had been eating peanuts, and was taken with the symptoms of foreign body in the air-passages. The babe was brought at once to Dr. W. D. Hamilton, who found it cyanotic, almost pulseless. Chloroform was given cautiously, and the trachea opened. By means of a mirror light was thrown into the wound, and the body, consisting of one entire kernel, and fragments of another, removed with forceps. The little patient recovered promptly.

DR. HERRICK.

On returning to the city, after a short absence, I learned that a child, eighteen months of age, while playing with beans, had gotten a bean into its windpipe. A physician was called, and when he arrived the child was suffering with difficulty of breathing, having marked dyspnea, which soon subsided. On my return to the city, I attended the case a day or two. At this time there was slight difficulty of breathing only, and the child was in a pleased condition of mind, but there was not a cynotic condition, but a slight, hacking cough. I saw no demand for operation, and so expressed myself. I attended the case another day, with the same conviction. Some four days after this experience, I was called by telephone about six o'clock in the morning, and told that the child was dead, having died immediately on being awakened from sleep. This was the result of delay of operation in a case where the history was somewhat obscure. The bean was in the windpipe. I made an autopsy, but was unable to find the foreign substance, although it must have been in the trachea or about the larynx. It must have lodged lower down, about the bifurcation. I mention this case simply as one bearing on the necessity of an operation, where you are aware of the existence of foreign bodies of any kind.

DR. O. T. MAYNARD.

I wish to speak of a case similar to the one just reported, which emphasizes the necessity for an early operation. A number of years ago I was called in consultation to see a child, which had swallowed a kernel of corn. The child was then playing around the room. The attending physi-

cian had urged an operation, but the family had not come to such a conclusion. When they sent for me, I heartily agreed with the physician, but the family would not permit it. About 10 o'clock A. M., two days later, the child died very suddenly of suffocation while playing upon the floor, not having suffered any severe symptoms between my visit and its death.

DR. MAX THORNER.

Gentlemen — I am very glad this topic has caused so much discussion, for it is of great importance. These accidents may happen to any one, and we are likely to be called on to act at once and energetically at times, when we least expect it. I agree with all that has been said. I certainly did not mean to say that I would operate in cases where we have only a vague suspicion of the presence of a foreign body. I believe it would occur to none of us to operate in such cases. However, if the first case I reported had died without an operation, I would have blamed myself very much for not having performed a tracheotomy. For this reason, I think, in cases where we have sufficient evidence of the existence of a foreign body, we ought to operate. I believe it is the best plan to pursue.

PHLEGMONOUS PHARYNGITIS.

THOMAS HUBBARD, M. D., TOLEDO.

Phlegmonous pharyngitis is characterized by the presence of pyogenic cocci in the submucous tissue, whereby the normal fibrinous inflammatory products are liquified and septic pus is generated. It can not always be said to be a disease *per se*, since it is so often an aggravated form of the ordinary inflammation of the pharynx, but occasionally it exhibits unusual severity from the beginning, and thus deserves the distinct name, acute phlegmon of the pharynx. From the anatomical relations of the parts and their important functions, the disease in its usually severe type acquires an immense importance. Being of very fatal character, our refuge is in timely diagnosis and guarded prognosis.

The general symptoms of the various forms of phlegmonous inflammation are those that characterize all rapidly progressive septic processes. The onset is marked by a severe chill, and high fever soon follows, and, since the patients usually die before the adynamic stage is reached, the fever persists to the last. Delirium is common, and not rarely nausea and vomiting. Profound toxæmia comes on early, and this and the suppurative processes in the larynx constitute the chief dangers of the disease. The swelling in the respiratory tract may be phlegmonous œdema of the mucosa or accumulations of pus in and around the larynx and trachea. It is characteristic of this form of inflammation that it radiates in all directions, invading cellular tissue, and even the cartilages of the larynx

and trachea may be attacked. As soon as pus forms it burrows downward, dissecting up the mucous membrane, or if in the cellular tissue it follows along down the lymphatics, or large blood vessels, even into the thorax. Metastatic abscesses and septic endocarditis may occur.

There are three, possibly four, forms of micrococci that are found in the diseased tissue, and are the probable causative agents, and while we can not make a differential diagnosis on this basis, yet they aid in establishing the pathology. The *streptococcus pyogenes* and *erysipelatis* are found. Many bacteriologists assert that they are identical, but certainly there is clinically a difference between the diseases with which they are associated. There is undoubtedly a form of phlegmon of the pharynx which does not invade the skin, and in this *s. pyogenes* is found, while the constant presence of *s. erysip.* in ordinary erysipelas of the skin can not be doubted. The bacillus of malignant œdema has been found in phlegmonous inflammation of the cervical tissues. Staphylococci are present in all forms of septic pharyngitis and cellulitis.

Acute infectious phlegmon of the pharynx, as described by Senator, is a most virulent form of septic pharyngitis. The systemic toxic symptoms are very severe. The pharyngeal mucosa becomes swollen, passing from the condition of inflammatory œdema to phlegmonous œdema, dysphagia is extreme, and general cervical celluitis and adenitis is moderately severe. Pus forms very early in the submucous tissue, and if life be not cut short during the stage of phlegmonous œdema of the pharynx and larynx, the mucous membrane is dissected from the cellular tissue beneath, causing gangrene, and death may be caused by toxæmia or mechanical obstruction in the respiratory tract from accumulations of septic pus.

I remember to have assisted at the autopsy of a young woman, dead of acute phlegmon of the pharynx, in which area of gangrenous tissue was most extensive. From the naso-pharynx above to about the middle of the trachea the

mucous membrane was entirely separated from the cellular tissue by purulent matter. The marvel was that life could have been so far prolonged, when there was such extensive swelling in the respiratory tract. It emphasizes the futility of surgical interference in severe cases. The cellular tissue of the neck was not extensively involved, but abscesses were found in the anterior mediastinal space.

We have stated that pharyngitis or peritonsillar cellulitis of ordinary severity may become phlegmonous and speedily fatal. More often it is of the virulent type from the beginning, but occasionally the phlegmonous process is intercurrent. When we consider that the streptococci already mentioned are commonly present in the mouth we may not wonder that a mild septic cellulitis becomes of more virulent phlegmonous type under certain conditions.

By way of illustration of this point the following case is narrated: A young lady of excellent general health was taken sick with quinsy, on April 24. Consulted the family physician on the 29th, and was confined to bed from this date. On May 1, one tonsil was punctured, but very little pus escaping. The temperature remained high, 103.5° to 104.5°, and the pharyngeal inflammation became phlegmonous in character. The symptoms of systemic infection became quite pronounced, and there was considerable cervical cellulitis. A nasty grey membrane formed at the seat of puncture, but only at this point. Thirty-six hours before death she complained of pain in the right sub-clavicular region, and there was considerable œdematous swelling over this area, probably a metastatic abscess in the anterior mediastinal space. At 4 A. M., May 4, she began to fail very rapidly. I saw her, in consultation, for the first time, at 9 A. M. She was already *in articulis mortis*, and death came in a few minutes. It may have been caused by phlegmous œdema of the epiglottis, or general toxæmia, but attendants say that her voice was clear, and that there was no pronounced difficulty in breathing. This case illustrates the importance of the use of antiseptic precautions

after incising a tonsil. Commonly, such incisions are made through devitalized tissue at the place of pointing and no cellular infection results, but where hyperæmic tissue is punctured to reach the tonsillar abscess, the danger of infection is great from the breaking down of structural barriers.

Erysipelas of the mucous membrane is rarely primary. It may reach the pharynx by extension through the mouth, nose, or external auditory canal and Eustachian tube. The character of the inflammation, in primary erysipelas of the pharynx, does not enable us to make the differential diagnosis between it and acute infectious phlegmon of the pharynx, but the subsequent invasion of the skin, which is the usual course, determines the nature of the disease. The pharyngitis may be simply a mild septic inflammation, phlyctenular, or herpetic, or gangrenous. In that form of facial erysipelas that shows a tendency to involve mucous membranes the constitutional symptoms are usually aggravated; and then, too, we often have visceral disease in these subjects, which so lowers the general health standard that there is little resistance to the ravages of the disease. Osler states that septic endocarditis is common in these cases.

Phlegmonous pharyngitis may occur in a late stage of scarlet fever, and be followed by deep-seated cellulitis and abscess formation. When the local symptoms are unusually severe, the general disease may be masked. The following case illustrates the difficulty of diagnosis:

In March, 1893, I was called in consultation to see a girl of nine, who had been sick with so-called quinsy for about a week. She was subject to tonsillitis, and the mother employed common domestic remedies in this attack. The family physician had been in attendance only one day prior to my visit. We obtained the following account of the onset of the sickness: About two weeks previous she had had slight sore throat. In three days she was able to go into the country, and was exposed to a strong

cold March wind for some hours. Soon after quinsy developed, but she was not confined to bed until the day of my visit. We found her with a temperature of 104.5°, pulse 160, respiration rapid, slightly delirious at intervals. The tonsils met in the median line, but there was no softening indicative of pus formation. The stage of acute pharyngitis had subsided, but the membrane was still phlegmonous. The submaxillary glands were swollen, and beneath the sterno-mastoid muscles, at about their middle, there were swellings of considerable prominence, the area of infiltration reaching from the mastoid attachment to the sternum. Movement of the head was very painful. Twenty-four hours later the fever and general conditions were about the same, and the sterno-mastoid swellings were slightly circumscribed. The tonsils were considerably smaller, and she swallowed very easily. She complained of pain near the upper part of the sternum, on the right side, and there was considerable œdematous swelling in this region. Respiration was not impeded, but the heart was becoming very feeble, in spite of vigorous tonic treatment. She took nourishment very well, but the temperature remained in the neighborhood of 105° constantly. We decided to incise the abscesses the following day, but she expired very suddenly at 4 o'clock the next morning. Attendants said that she was apparently improving during the night, taking nourishment freely, and, in fact, died while she was in the act of drinking milk. The subsequent history of sickness in this family throws some light on the case. About eight weeks later I was called to see a younger sister, who had acute pharyngitis and fever. The pharyngeal membrane was congested and boggy, indicating a mild degree of septic inflammation in the sub-mucosa. Even in the early stage I found the same swellings in the sterno-mastoid muscles. Soon a scarlet rash appeared, and the diagnosis was settled. Under careful management on the part of the physician who took charge she went on to recovery. The inflammatory tumors persisted for some days, but subsided with the pharyngitis.

This case of scarlatinal cervical cellulitis suggested angina Ludovici, before the causation was established by the second case. Such an inflammation occurring idiopathically might properly be thus classified. There seems to be considerable confusion in English medical literature as to the exact nature of the angina of Ludwig. For instance, in the *International Clinics*, for April, 1891, Jas. Finlayson, of Glasgow, publishes a lecture on "Angina Ludovici in its Relation to Diphtheria." The classical description by Ludwig, in 1836, refers to a cervical cellulitis, idiopathic in origin, involving primarily the mucous membrane and tissues beneath the supra-hyoid fascia. It begins as a pharyngitis or tonsillitis usually, and extends with alarming rapidity to all of the cervical tissues, unless life be cut short by stenosis in the larynx. American writers have fallen into the same error as the English. Osler refers to scarlatina as a cause of angina Ludovici. Either a. L. is not a disease *per se*, and Ludwig made narrow observations, or such descriptions of the disease are incorrect. To be sure the term idiopathic is often a mere acknowledgement of ignorance of causes, but certain it is that scarlatinal and diphtheritic cervical cellulitis should not have the name angina Ludovici to confuse their literature.

The treatment of phlegmonous inflammation of the pharynx is exceedingly unsatisfactory. In general, it is the same as that for all septic diseases. Phlegmonous tumors in the neck should be incised even before distinct fluctuation is determined. Deep external incisions, such as employed in post-pharyngeal abscesses, should be tried when there is pus in that region. All incisions into the mucous membrane or tonsils should be immediately followed by strong antiseptic gargles, which latter should be used almost constantly.

If the character of the inflammation be distinctly phlegmonous, neither tracheotomy nor intubation will materially prolong life, but one or both should be tried in doubtful cases.

DISCUSSION.

DR. MAX THORNER.

I believe the author has included under the name phlegmonous pharyngitis a number of affections which, not long ago were considered different, but which we must now consider very similar processes. Phlegmonous pharyngitis was considered, until six or seven years ago, a simple inflammation of the pharynx, with sub-mucous infiltration, and the localized formation of pus, in the form of an abscess, somewhere in the pharynx. A few years ago a disease was described by Senator, of Berlin, which was considered a new disease, ending in all cases fatally. The patients were taken sick very suddenly, always in the best of health, with intense pain in the throat. They would have a high fever, and would sometimes become delirious. The pharyngeal mucosa appeared to be infiltrated with pus. In all cases albumen in the urine was found in the course of the disease, and the patients died between the fourth and fourteenth days. This disease was called acute primary infectious pharyngitis, or primary phlegmon of the pharynx. Numerous reports of similar cases followed, but it soon became apparent that it was a disease well-known before, and only described under different names. If we look through our literature we will find a number of cases similar to it. Dr. J. C. Culbertson, of Cincinnati, reported a case before the Cincinnati Academy of Medicine, and which appeared in the *Lancet-Clinic* in 1887. The patient was a little girl, who was taken ill with the symptoms of an ordinary pharyngitis. Suddenly they increased considerably, there appeared a diffuse infiltration of pus in the sub-mucosa of the throat, and the child died. This leads me to investigate as to what is actually the pathology of the disease. The general view was that this was a kind of infectious pharyngitis. What is pharyngitis? It is now conceded by most authorities that ordinary cold does not cause pharyngitis, although it may be a predisposing factor. As Dr. Hubbard has stated, there are a number of cocci at all times in the mouth, and it has been found that the streptococcus pyogenes aureus is present in many of these inflammatory processes. If we conceive these germs as the cause of phlegmonous pharyngitis, and if we find that we have the same thing in erysipelas of the pharynx, then it leads us only one step farther to say that primary

infectious pharyngitis and erysipelas of the pharynx are the same disease. The point of differential diagnosis between an ordinary and phlegmonous pharyngitis: We have in the beginning nothing but a high fever in the midst of good health, but an infectious phlegmonous pharyngitis progresses very rapidly. The severity of the general symptoms is far in excess of the local trouble. Another point: what we considered formerly as phlegmonous pharyngitis or quinsy, was nothing but a disease of the tonsils or of the peritonsillar tissues; but in phlegmonous pharyngitis we have a deep inflammation all through the pharyngeal tissues. We have not to deal with a localized collection of pus, but with a deep purulent infiltration of the submucosa. You can not relieve this pus, for it is disseminated through the tissues. We have here a general infection and a general disease. At the post-mortem we generally find pus in other organs also, and these patients all die, if from nothing else, from toxemia. There is no hope of saving these patients by tracheotomy, and so far none have been saved in that way. If we desire to differentiate the phlegmon of the pharynx from erysipelas of the pharynx, we may say that erysipelas is a surface process, while phlegmon is a deeper process, leading to mortification of tissues. Practically, on the skin, we differentiate them also, while theoretically we might conceive, especially since the streptococci have been found in both affections, that they are caused by the same *materies morbi*, and, therefore, nothing but different forms of the same disease.

DR. THOS. HUBBARD.

I believe, clinically, there is a distinction between the phlegmon of the pharynx and erysipelas of the pharynx, for this reason: In erysipelas of the mucosa, the advance is indicated by the same appearance found in the skin. It invades the membrane gradually, while in the true phlegmon of the pharynx the inflammation is very deep-seated, and covers a large area, almost spontaneously.

The simple forms of pharyngitis may become phlegmonous, since it is proven that streptococci are constantly present in the mouth, but only rarely do they invade the submucosa, and then with terribly fatal effect.

EXUDATIVE INFLAMMATIONS OF THE MIDDLE EAR.

By S. E. Allen, M. D., Cincinnati.

Inflammatory affections of the mucous membrane of the middle ear are of two kinds. The non-exudative, dry, sclerotic, interstitial forms of inflammation, and the exudative inflammations. The exudative inflammations can be divided into three essentially distinct groups.

1. The purely catarrhal forms, similar to catarrhal processes elsewhere, and etiologically as obscure.

2. The acute infectious group, in which the exudation is mucoid, muco-purulent or purulent, according to the intensity of the reaction to the infection; and

3. That vast and troublesome class of inflammations included under the term chronic otorrhœa.

We have, then, catarrhal inflammations, acute infectious inflammations, and chronic suppurations. In the first or purely catarrhal form there is very little inflammatory reaction. The patients do not complain of pain, and they seek the physician, as a rule, only when the exudation and the swelling of the mucous membrane cause impairment of the hearing, tinnitus or some other similar subjective symptom. These cases fall into the hands of specialists, and do not, therefore, concern us here.

The second class, the acute infectious forms, are those in which we are most interested. These inflammations are essentially sudden and abrupt in their onset; they pursue a definite course, although varying greatly in intensity, and are accompanied by that most distressing of subjective

symptoms, pain. Intelligence and skill can, in these cases, do a great deal toward warding off dangerous complications, avoiding impairment of the hearing and preventing the case becoming chronic. The inflammations included under this second class are in the text-books generally separated into the acute so-called catarrhal form, when the secretion is mucoid or muco-purulent, and into the acute suppurative form. The two are so closely allied in their initial stage that it is often impossible to tell with which we have to deal. Etiologically, also, they both come under the head of infectious inflammations; that is, they are both caused by micro-organisms, so that the separation of the two into distinct classes is better avoided, although the exudation in the one class of cases may be almost pure mucus or muco-serous fluid, and in the other pure pus. In the different varieties of exudation, numerous species of bacteria have been found, in some cases as almost pure cultures, in others one form simply predominating over the others. The diplococcus pneumoniæ Fraenkel-Weichselbaum, the diplobacillus Friedländer, and various pyogenic bacteria, such as staphylococcus pyogenes aureus, albus, etc., have all been found, cultivated, and in several cases inoculated and proven to be causative agents. Zaufal found that the serous and muco-purulent exudations contained diplococcus and diplobacillus pneumoniæ, while in purulent exudations he found staphylococcus pyogenes. The pneumonia bacteria can, however, bring about suppurative inflammation, as well as the true pyogenic organisms, although, according to Zaufal, grave middle-ear suppurations, with bone complications, are caused by staphylococcus pyogenes. These infectious inflammations, therefore, vary greatly in intensity, and are not processes of invariable similarity. Their manifold character is due to the variability in the causative agents, the varying species of bacteria, and to the difference in resisting power of the mucous membrane of the tympanic cavity in different individuals. To give an account of the subjective and objec-

tive symptoms would be superfluous. The diagnosis of an acute inflammation can easily be made. To differentiate between the muco-purulent and true purulent form is at first difficult and often impossible. The points of difference are that in the purulent form the reaction is more intense, the drum membrane is more swollen and reddened, and frequently the epidermic layer softened and scaling, so that the drum has, at first glance, a whitish appearance. Then the auditory canal itself is more inflamed, and the pain and fever are more severe in the purulent form. The muco-purulent form affects the drum membrane much less, and perforation does not take place, while a purulent exudation bursts through the drum generally in two or three days.

There can be but little doubt that these acute middle-ear inflammations are caused by bacteria, even those cases where the mucoid or serous fluid is but faintly tinged with pus cells, and where no perforation of the drum takes place. Now, how does infection take place? It may take place in one of three ways:

1. Micro-organisms already existent and dormant within the tympanic cavity may become active, and be enabled to develop and work into the mucous membrane, owing to some nutrient change therein. General diseases, which weaken the resisting power of the cells, may, therefore, predispose to acute inflammation.

2. Microbes may gain access from the pharynx by being mechanically forced through the Eustrahian tube; and

3. The infection may be transplanted from the pharynx by way of the lymphatics and blood vessels of the submucous and mucous tissue of the tube.

A rational treatment of these inflammatory processes must be based upon a proper understanding of their etiology. Bearing in mind their *infectious* nature, what, then, are the indications for treatment. In the first stage, that of acute congestion with intense pain, depletion of the blood vessels of the part is the most active and satisfactory

manner of alleviating the symptoms. The veins from the tympanic cavity empty into facial veins just anterior to the tragus, and it is here that the leeches should be applied—one, two or three, according to the amount of inflammation and the vigor of the patient. This withdrawal of blood operates in a three-fold manner.

1. The depletion of the vessels relieves their tension and pain.

2. Deleterious substances, whether of bacterial origin or not, are withdrawn from the area depleted; and

3. The restoration of the tissues to a more nearly healthy vascular condition, assists in the inhibition of bacterial reproduction.

The usefulness of bleeding in the early stages, as a means of relieving pain and combating the inflammation, can not be too strongly urged. In cases where the pain is less severe and the signs of inflammation less intense, the application of heat is a very reliable method of comforting the patient. Heat may be applied in the form of hot-water compresses, hot water syringing of the meatus, or as dry heat. As a pain reliever, Hartmann some years ago recommended the dropping into the canal of a solution of carbolic acid and glycerine, one in ten. I can attest to the value of this remedy. A second indication for treatment is the following: The disease is caused by bacteria of very varying virulence in the different cases, and Zaufal has shown that it is possible for one form of organism to gain access to an inflammed middle ear and drive out the primary exciting form. If, therefore, we are fortunate enough to have to deal with a case where the exciting cause is a germ only able to cause in that person a slight reaction, every care must be taken to avoid the entrance of more active germs. And, also, if the resisting powers of a person attacked by a non-virulent species be maintained, we can hope to retain the bacterial activity within the muco-purulent non-perforating line. The entrance of active *pyogenic* organisms must be strenuously guarded against. Hence,

the use of the catheter or Politzer bag should be interdicted entirely, and the patient warned against the Valsalva method. No inflation should ever be practiced until long after the acute symptoms have disappeared. It is well to remove all infectious matter from the nose and naso-pharynx by careful syringing or spraying, getting rid of, in this manner, as far as possible, of this source of infection. In the suppurative form, even after perforation has taken place, asepsis must be strictly carried out. The asepsis must be all the more vigorously enforced when the suppuration begins to subside, when the original exciters are dying out, because at this time other pyogenic organisms can the more readily gain access.

The primary organisms die out, leaving the resisting power of the mucous membrane reduced to a minimum, and others find in this a most excellent medium in which to develop. *This bacterial reinfection is a very important factor in the causation of the transference of an acute into a chronic otorrhœa,* An acute suppurating middle ear should be cleansed and bandaged as carefully as an acute suppurating cavity anywhere else. The auditory canal should be stuffed with gauze, and the entire auricle covered with aseptic cotton, secured by a roller bandage. The demands of aseptic surgery are in no wise fulfilled by simply stuffing the meatus with gauze or cotton. Such plugs offer no barrier to secondary infection. We must endeavor to, as thoroughly as possible, guard against the reinforcement, as it were, of the primary exciting germs, and then these will, in the majority of cases, run their course in a comparatively short time, and a cure take place. Clean and *bandage* acutely suppurating ears carefully and thoroughly. Zaufal even goes so far as to aseptically close the auditory canal in cases of acute inflammation with no perforation.

A third indication for treatment is naturally the employment of any means in our possession capable of hurrying up the process or of avoiding complications. The maintenance of a uniform temperature, and the avoidance of

excitation, are of great advantage. The patient, in all forms of acute inflammation, should be confined to the house — to his bed, if the symptoms are severe. Hot applications are of great use, both in relieving pain and in accelerating the course of the disease.

A fourth indication is for operative measures. In the milder forms paracentesis will rarely be necessary. If, after all acute symptoms have subsided, the secretion is not absorbed during the following week or so, or shows no reduction in amount, the operation may be performed. If the drum is much bulged and the pain persistent, of course paracentesis is called for. Although in purulent inflammation the drum is generally perforated on or before the third or fourth day, still if there is pain and the inflammation is intense, and these are not relieved by leeching, hot applications, etc., paracentesis can and should be made even within thirty-six hours. If violent symptoms, headache, dizziness, delirium, etc., arise, of course immediately. In the non-perforating muco-purulent form, external massage is often of great service in hastening absorption of the exudation. The parts are to be stroked downward from the base of the mastoid process to the clavicle for from three to five minutes once or twice a day. In the purulent form, after all acute symptoms have subsided, there often remains a thin purulent secretion. (This especially where asepsis has *not* been carried out.) A remedy, which is of considerable value in such cases, is a solution of the acetate of lead. After thoroughly cleansing the ear, a weak solution, say one or two drops of the lead solution to a teaspoonful of warm water, should be instilled, left a few minutes and then turned out. The strength of the solution can be increased from day to day. While acute symptoms last no astringent medicament whatever should be instilled.

In violent cases of purulent inflammation, and such cases are caused by some active pyogenic organism, the mastoid region is prone to be drawn into the process. Either the inflammation extends from the tympanic cavity by con-

tinuity. or the germs are carried over in the secretion, which, owing to its inability to find exit through the drum, is forced over into the antrum and cells. In some cases, it would seem that the infectious matter attacked the tympanic cavity and the mastoid cells at the same time, and that the two inflammations went hand in hand. The diagnosis of acute mastoid trouble of some sort is easily made. Subjectively, we have intense pain in that region, with headache, dizziness, etc.; objectively, there is more or less swelling, tenderness, redness and œdema. That something is the matter with the mastoid is, as I have said, very readily seen. To form any definite idea of the extent and character of that trouble is very difficult. Intense redness and swelling, with marked œdema, can entirely disappear after vigorous leeching, or after the prolonged use of the ice bag. In such cases, there could not have been much, if any, suppuration or necrosis. On the other hand, there are cases where, with scarcely any redness and with no œdema, and but slight pain on pressure, the entire cortex shows itself to be destroyed by granulations, and sequestra of considerable size are found deeper in. I do not think we can, with any certainty, predict the state of affairs.

Whenever mastoid symptoms arise, vigorous antiphlogistic measures should be immediately begun. Leeching, application of the ice bag, or Leiter coil, confinement of patient to bed, etc. If the symptoms continue to increase, in spite of all we can do, and if these are not of a threatening character, we should not wait more than from forty-eight to seventy-two hours before operating. If there is no increase in the violence of the symptoms, and still no decrease, the operation should not be put off more than three or four days. Increased fever, intense headache, delirium, etc., are, of course, indications for immediate operative interference. The early operator will now and then find that he has operated unnecessarily. Cases have been opened up by most competent operators where, beyond hyperæmia and a swollen condition of the mucous

membrane, both antrum and cells were found normal. Early operation, however, saves many patients, hastens recovery and avoids much needless pain. Antiphlogistic treatment should always be given a fair trial, but we should not delay, if this proves of no avail. *The external appearances can not be relied upon to be indicative of the amount of destruction which has taken place within.* Of course, it is evident that an operation is necessary when we have an undoubted abscess over the process. When an evident abscess is not present, but simply swelling, redness and tenderness, this outward appearance may stand for simple hyperæmia of the cells, or for their almost complete necrotic destruction. The operation, when unnecessarily performed, does little harm, and this opening of the mastoid cells and antrum has a marked effect on the accompanying middle-ear suppuration. An ear may be discharging profusely prior to the operation and stop almost immediately afterward, and this even when the cells are found healthy. The operation seems to have a marked revulsive effect on the suppuration. So remarkably prompt is this effect that one would almost feel like advocating surgical interference simply to cure the otorrhœa. Time forbids any remarks on the technique of the operation.

We now come to the consideration of *chronic otorrhœa.* We know that chronic suppuration supervenes upon acute suppuration. What, then, are the causative factors which render this transformation possible? First of all in importance is the reinfection, so to speak, of an acutely suppurating mucous membrane by other active pyogenic organisms, which find in the thereby weakened membrane a fit medium for their development. The neglect of an acute otorrhœa from an aseptic standpoint is accountable for a very large number of the chronic cases. The cells may fight out the fight successfully with the primary bacteria, but, worn out by the struggle, be unequal to a renewed combat with fresh ones. If, in our treatment of acute suppurations, we did nothing but strenuously avoid all reinfection, there would be much fewer chronic cases to work with.

The other two causative factors, in keeping up a suppuration, owe their existence to the anatomical structure of the parts involved. The median wall of the tympanic cavity is thin, and composed of hard, compact bone, which receives its blood supply from the vessels of the thin muco-periosteal membrane covering it. The remaining portions of the cavity are bounded by rough cancellated bone. Should the muco-periosteal membrane of the labyrinth wall become much diseased at any point, this would cause the underlying bone to be deprived of blood, and a superficial necrosis would be the result. Very frequently, in chronic cases, where there is destruction of the membrane tympani, we can see on the labyrinth wall small spots of deeper red than the surrounding mucous membrane, and more thickened. Often, indeed, these spots are developed into small granulations. After the rest of the mucous membrane has become paler under treatment, these portions retain their color. If examined with a sound, they ofter reveal rough bone, thus showing that a small necrotic fragment is the cause of the condition. By treatment we can bring the suppuration to a standstill everywhere but at these places, and as soon as treatment is suspended, the suppuration from them as a starting point spreads again over the entire mucous membrane. Treatment of an otorrhœa very frequently soon checks the discharge, and the case is looked upon as cured; in a short time, however, after the discontinuance of treatment, the suppuration begins anew. At the root of such cases may lie a small or several small necrotic fragments of the medial wall.

The cancellated boundaries of the tympanic cavity are, as the result of disease of the muco-periosteal covering, very prone to undergo carious degeneration. Caries is, in fact, one of the most frequent occurrences in connection with the temporal bone. With this degenerative process going on, it is, of course, impossible to bring about a cessation of the suppuration.

Now as to treatment. As above indicated, three things

tend to prolong the suppuration. 1. Reinfection; 2. Labyrinth necroses; 3. Caries. Reinfection can be avoided only by keeping out germs by proper aseptic bandaging, etc. If it occurs, thorough cleansing with one of the antiseptic washes will soon bring about a cure. For this purpose almost every antiseptic that has appeared has been most highly recommended—has been extolled as the best remedy by some one. As a matter of fact, one non-irritant antiseptic wash is about as good as another, because these remedies can only combat the first, the bacterial, element in the causation; against the necrosis and caries they are all powerless. The neglect in taking these last two factors into consideration, is what has caused so much dispute as to the value of the different antiseptics. Bearing in mind the fact that superficial necrosis frequently occurs on the labyrinth wall, and that the carious process attacks other parts of the cavity, such as the head of the malleus, portions of the incus, lateral wall of the attic, neck of the antrum, etc., we should avoid, in choosing our antiseptic, anything which will obstruct our view and render it impossible to see what is going on. Powders, like boric acid, etc., ought seldom to be employed, because it is of the greatest importance that one sees the exact condition of things. If there are necrotic spots on the labyrinth wall, the granulations which spring up around them, or the succulent mucous membrane over them, must be cauterized, and every endeavor made to expedite exfoliation. I do not decry boric acid or other powders, because they are ineffective remedies, or because I think there is much danger of damming back the secretion, but because they obstruct the view. If caries exist about the head of the malleus, a clear field is absolutely necessary to enable us to diagnose it. If diagnosed, the removal of the ossicles is indicated. Caries in the attic, or antrum walls, frequently allows granulations to grow downward, through perforations in the upper-posterior wall of the auditory canal into the latter, and we must be able to see them. We should

examine every case of chronic otorrhœa, if possible, without first syringing the ear. Syringing causes such a general hyperæmia that minute granulations escape detection. Our thoughts should be on caries and necrosis, and our special attention should be directed toward the upper portion of the drum, to the posterior-superior wall of the canal, and to the labyrinth wall, because granulations here indicate disease of the bone beneath. If there is no bone disease, the washing out of the cavity with a weak bichloride solution, and, if necessary, adding to the thoroughness of this cleansing by using a normal salt solution through the Eustachian catheter, will bring about a cure in a short time, Should portions of the bone be carious, these parts must be scraped out and the diseased tissue gotten rid of. Carious ossicles must be removed and affected parts in the antrum or attic searched before a permanent cure can be expected. Operative interference is now indicated, and by it alone can we hope to bring the suppuration to a standstill. All the antiseptics on the list will not cure these cases.

I should like to discuss the operations which are to be performed in these chronic cases, and also to speak of the interesting subject of so-called "Cholesteatoma Formations," but time forbids.

DISCUSSION.

DR. BAKER:

I had the pleasure, about ten years ago, of reading a paper before this Society, on the treatment of these cases by the application of dry boracic acid. Up to that time, a very large proportion of my cases, in private and dispensary practice, were cases of chronic purulent discharge from the middle ear. These cases pursued a chronic course, lasting from one to fifty years. They were considered incurable. The text-books only directed to keep them clean, and remove any polypi or foreign substance found. Since the introduction of the use of boracic acid these cases all recover. By papers read before the Medical Societies, and

publications in medical journals, the specialists have induced the general practitioners to treat these cases with boracic acid, and the consequence is, the specialist has few of these cases to treat at present. It is the best, and to my mind, the only scientific plan of treatment. The Doctor speaks of obstructing the view. In the use of the boracic acid the drug becomes dissolved in the purulent discharge, and does not block the ear, and in this respect is superior to any other powder. It is dissolved, comes out, and leaves the field of vision free and unobstructed. Now, I grant there has been harm done in the use of boracic acid in powder in unsuitable cases. A case with polypi would not be a proper case to treat in this way. An acute, or sub-acute case would not be one in which to use the powder. A case in which there was diseased bone present, which could be removed, would not be a suitable case until the diseased bone was removed; but after you have removed all these contra-indications, if you continue the syringing, the purulent discharge will continue indefinitely, but if you pack the ear full of dry powder, the probabilities are you will not have to pack it more than once or twice to effect a permanent cure. Now, this is a principle which is established, and I would not wish you, as general practitioners, to be mislead by any philosophical reasoning to give up this line of treatment, which has been so well established. I grant all that has been said about receiving the infection through the nose, and the necessity of cleansing the nostrils. In these cases, I have gone back to the use of nitrate of silver, and brush the post-nasal cavity in all cases of purulent or non-purulent inflammations of the middle ear. By brushing the throat with nitrate of silver, after having first cleansed it, in the vast majority of cases, the purulent inflammatory trouble will be prevented. I am not afraid of using the Politzer bag. If the case is first thoroughly washed and cleansed, and then brushed with nitrate of silver, I think there is no danger of infecting the middle ear, as stated by the essayist. I think, in many cases, valuable service may be rendered by the use of Politzer's bag, but I deem that this should be used with care, and that it often has done harm.

In acute cases, I should not recommend any one to pack the ear with cotton and gauze and leave it that way. That is the very thing I should not do. These cases should be treated openly; there should be an outlet for the pus. In the treatment of acute and sub-acute purulent inflamma-

tions of the middle ear I have taken alcohol with boracic acid, about thirty grains to the ounce, and instilled this into the ear every hour. This will check the discharge in a very short time. In fact, I can not remember a single acute case in the last five years' practice which has become chronic, and which has extended over a period of several months, in which this treatment has been faithfully used. This solution can be used full strength. In chronic cases, in which there is polypi, I use absolute alcohol, and I very seldom, unless the polypus extends out into the external meatus, have to use the snare.

DR. D. J. MERRIMAN:

I wish to add my testimony to what Dr. Baker has said in reference to chronic otorrhœa. I have had great success with boracic acid, after cleansing the ear, and never syringe until the ear is perfectly cured. I have had a number of cases which had been discharging a number of years, and in one of these cases two packings with the dry boracic acid brought about a perfect cure. For acute inflammation I have used the method formerly employed by Professor Williams, of Cincinnati, when I attended his clinic, that is, filling the ear with warm water, and covering the ear with cloths wrung out of hot water. This affords almost immediate relief, and helps reduce the inflammation very rapidly.

DR. COLEMAN:

I wish too add a word in reference to the use of boric acid in the treatment of suppurating ears. While I was in charge of an institution, there were treated a number of children with suppuration of the ear, in many of them this discharge being very offensive, and some had to be excluded from school. The treatment was simply that the ears were syringed out with a very weak solution of carbolic acid, and then packed with boric acid. In the great majority of cases the second or third packing stopped all suppuration. I, afterward, was absent from the institution some four to six years, and upon my return, I found between twenty-five and thirty cases of suppurative ears, many very offensive. We went to work by the same method, and of all that number, within sixty days, there were only two suppurative ears in the institution, one of

these being a case of necrosis of the mastoid, and the other a case of disease involving the bones of the ear. I simply add this in support of what Dr. Baker has said, and I wish to say I have carried out this method, and, notwithstanding the essayist did not allow much influence from the use of powders, I must certainly add my testimony in favor of the use of boric acid.

DR GAGE:

The subject of chronic otorrhœa is of interest to me, especially since I have had a case of a lady, aged 32, who had trouble with her left ear as long as she could remember. I was called to her bedside after she had been suffering some, and I commenced using antiseptic solutions, carbolic acid, bichloride, applications of heat, with no effect, apparently, except she grew worse. After three or four days I became alarmed. Upon looking up the works on the ear and the ætiology of these diseases, I found so much that I was actually confused. I found a great many advocate the solutions, while others advocate dry medication. After having given the matter considerable thought I found that after the use of the syringe the pain became very intense. The lady had a convulsion, which lasted for about twenty minutes. I then decided not to use a syringe again, even gently. I took some surgeon's cotton, made a small swab, introduced into the ear, and removed all possible moisture I had introduced, and immediately plugged the ear with boracic acid. Under this treatment the case grew rapidly better, and after about twenty-four hours the patient concluded she could lie on her left side, a thing she had refused to do before, although I had insisted it was better for her to do so. A few hours afterward suppuration was fully established, and the ear discharged profusely for about twelve hours, after which, after carefully wiping the ear again, and packing it with boracic acid, we had convalescence established, and to-day the lady is quite well. I really do not know why I used this treatment, but, possibly, it was from confusion, and because older physicians had previously made use of antiseptic solutions in her case.

DR. X. C. SCOTT:

Mr. President — I desire to enter my protest against the frequent necessity of removing the ossicles in each and every case. I speak from a good deal of experience, and

extremely rare are the cases in which I have found it necessary to remove them. This may be avoided and, in the great majority of cases, the disease stopped by the application of aromatic sulphuric acid. I desire, also, to add my testimony to what has been said about Politzer's bag. I do not see how we can treat these cases without Politzer's bag, for it is certainly necessary to thoroughly cleanse the parts and force the pus from behind the drum membranes, should there be any of the drum-head membrane remaining, and the only way we can make this cleaning is by the use of Politzer's bag. Another thing I have used is a powder composed of tincture of callendula and boracic acid. It is made with a drachm of tincture of callendula, a drachm of boracic acid, thoroughly mixed, and then another drachm of boracic acid added, which composes the powder. I desire to enter my protest that, in chronic purulent inflammation of the middle ear, it is always necessary to remove the ossicles and scrape the tympanic cavity, because it is not true.

DR. ALLEN:

I do not think it worth while to take up the time of the gentlemen by discussing this matter further. In my paper I have given the opinion of the best specialists of the world upon the subject. The gentlemen who have spoken are simply eight or ten years behind. (Applause.)

MALIGNANT GROWTHS OF THE SKIN.

PARTICULARLY OF THE FACE. THEIR EARLY RECOGNITION AND TREATMENT.

By William Thomas Corlett, M. D., L. R. C. P., London.

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It is not the purpose of this paper to enumerate all the malignant diseases of the skin, nor to detail all of those that are known to attack the integument of the face, but rather to call attention to certain affections having a special predilection for this region, which, according to the writer's experience, especially merit attention at this time. For it is to medical men engaged in general practice that those afflicted with the conditions to be considered first apply for aid. For this purpose, and to present the subject briefly, but two cardinal pathological conditions will be considered: Tuberculosis and epithelioma, these being the malignant growths most commonly encountered, and upon whose early recognition and prompt treatment so frequently depends the patient's life.

By tuberculosis of the skin we mean an inflammatory condition occasioned by the presence of the bacillus tuberculosis, which leads to gross destructive changes in the part attacked, from which it has been named lupus. Two varieties of this disease are met with: Lupus vulgaris and lupus erythematosus. The first is encountered early in life, and most frequently appears during the second decade. Lupus erythematosus seldom appears before thirty, and, from the greater resistance the skin acquires against this

bacillus at this time, it appears in a milder form, is not accompanied by the disfiguring loss of structure which characterizes lupus vulgaris, and less frequently leads to a fatal termination.

Confined to the skin, lupus is fatal to the integrity of the parts affected, but not to the life of the patient. It is only when it extends to the internal, vital organs that it becomes a fatal disease. As it most frequently attacks the face, particularly the nose and ears, its close proximity to the mucous surfaces facilitates its final extension to the meninges of the brain and to the pulmonary tract. Jonathan Hutchinson was wont to maintain that the lupus process seldom extends to the air-passages, although frequently encountered on the gums, tongue, and, sometimes in the œsophagus. He had seen it in the rectum in one case.* Unfortunately, this immunity of the air-passages does not obtain in Northern Ohio, as shown in the following case, which is selected from others of the same kind:

CASE I. — Annie N., æt. 13, delicate, mother died of phthisis two years previously. When the patient came under my care, November 24, 1890, one year after the onset of the disease, there was present a dark-red spot about the size of a silver three-cent piece on the right cheek. Irregularly scattered about it were millet-seed-sized papules or tubercles. They were not elevated above the surrounding skin, and the central lesion was even slightly depressed. This latter was covered with loosely-adherent scales, and a few small crusts, upon removal of which an irregular, easily-bleeding surface was exposed. The right lower half of the nose was also involved, as was the nostril of the same side, which, from the inflammation and cicatrization resulting therefrom, had contracted the opening to about half its normal size. In dilating the orifice sufficient for an examination it bled freely. The patient was given the

* Clinical lectures at the Hospital for Skin Diseases, Blackfriars, London, 1880.

potassium iodide to full toleration, and the compound tincture of gentian. Locally an ointment containing salicylic acid grs. xxv., oleate of mercury (10 p. c.) ʒi, and vaseline ʒi.

December 6. The eruption showed a marked improvement, but the potassium iodide was ill-borne, and recourse was had to a pill containing iron, arsenic and strychnine. This line of treatment was followed until October 1, 1891, at which time the eruption remained in *statu quo*. Repeated scarifications were then begun, as recommended by Vidal and others. After scarification, the surface was touched with creosote, and capsules of creosote were given internally.

November 25. The eruption was better than at any time since the beginning of treatment. There was, however, a grayish-white patch, surrounded by a bright red areola, on the mucous membrane of the lower lip.

December 26. A lesion similar to the one last noted had now appeared on the roof of the mouth, about an inch in front of the uvula. Soon after this it was noticed that the patient was losing flesh rapidly, she had a cough, and upon examination moist râles were detected in both apices. The patient grew worse rapidly, and died of phthisis during the Summer of 1892.

Although the lungs afford a favorite seat for the grave sequella of lupus, yet other structures may become involved, as in the following case:

CASE II.—Maggie R., æt. 27, seamstress, family history free from tuberculosis in its various forms, developed a patch of lupus on right cheek at the age of seven years. It was about the size of a twenty-five cent piece, and remained in a quiescent state until the age of puberty, when it assumed a more active condition. I saw the case for the first time February 16, 1884. At this time the face was badly disfigured. Scarification, caustics (the nitrate of silver and the acid of nitrate of silver), the internal administration of iodine and cod-liver oil were employed, but the disease extended. Finally, the external auditory

canal was attacked, and completely occluded with exudative material. In this condition local measures could be but ineffectually applied. About four months after, the patient complained of deep-seated pains in the ear, followed by delirium and death in September, 1886. The autopsy revealed an accumulation of pus in the internal ear, and tubercle nodles in the meninges of the brain in the corresponding side.

Even more frequent, as well as more fatal, than tuberculosis, is the rebellion of cells known as epithelioma. By this term we designate an infiltrating growth in the skin, composed of cells of the epithelial type. Epithelioma has likewise a subdivision in rodent ulcer, which differs but little in histological structure from cancer, yet, from its course and clinical aspects, it is entitled to a certain distinction, if not to be regarded as a disease *sui generis*. (According to Thin the cells of rodent ulcer have a uniform nucleolus, a non-granular protoplasm, and are characterized by the absence of epithelial nests.) Whether, with Malassez, Albarran, Cornil, Dubreuilh and Wickham, we accept the theory of the psorospermoses, of this we are certain, that epithelioma develops in those parts of the skin which, from their exposed positions, are subjected to irritation, and repeated injury; as a consequence, they finally become less able to resist the invasion of an external foe, or to regain their healthy tone after slight, though repeated, departures from the normal.

Believing that the various lesions and anomalies in which epitheliomata so frequently develop are, at the onset, distinctly local affections, it becomes necessary to speak of them as a premonitory condition. With epithelioma, when developed, text-books are sufficiently explicit to make it easy of recognition, and need not further concern us here. But it is when the death-dealing process lurks behind the mask of the simple anomalies of the skin, or in the simple and, at first, benign pathological disturbances of its structure, that we wish especially to emphasize at this time.

Of the cogenital anomalies of the skin which, after the

fourth decade of life, become cancerous, the papillomata stand at the head. The histories present a marked similarity, in that at a certain time the wart was injured, or that at times, when irritated, it became red and slightly painful. This condition may have continued for months or years, when, finally, from some lowering of the general systemic tone, the well-recognized characters of a malignant growth appeared. In the acquired papillomata the transition from the benign to the malignant is usually more direct and rapid. Neither does the presence of pigment exert any influence in determining this unhappy termination. For example, the lip has been exposed to the irritation of a pipe or a cigar, as age advances it shows the effects of this long-continued local stimulus, in the form of an hypertrophy—in this it but follows the natural law. In some there appears at the focus of irritation a variously-sized and shaped villous growth—a papilloma, on others this gives rise to an abrasion. Months and years go on, the part is subjected to the round of plasters and ointments, all more or less irrritating, until, finally, under this systemic cultivation, its malignant nature becomes strikingly apparent.

In the same way certain diseases of the skin predispose to epithelioma. Especially is this true of the derangements of the sebaceous glands. For this reason acne is always a source of menace to old people. What is even more common in the aged than acne, is the form of seborrhœa of the face, which has been aptly called by the French *séborrhée croûteuse*. This appears in the form of variously sized plaques, slightly raised above the surface, of a yellowish-brown or muddy color, firmly adherent, and when forcibly detached presents a base not unlike that in erythematous lupús. These sebaceous plaques usually break down late in life, and not infrequently give rise to epithelial cancers.

TREATMENT.—It is of the first importance that treatment be begun early in the history of these diseases. For

this, their early recognition, is necessary. Again, the ultimate success will depend upon the thoroughness with which the procedures adopted are carried out. The diseased process being confined at first to the structure of the skin, local measures are the ones upon which we must rely. It must also be borne in mind that in both lupus and cancer a vitiated constitution will enable the disease to pursue a rapid course. For this reason the general management of the case should never be lost sight of. Proper hygienic surroundings, good food and the ability to appropriate it should, if possible, be maintained. For this, the vegetable bitters, iron, and in some cases cod-liver oil, will be indicated.

In the local treatment of lupus, thorough destruction of the *materies morbi*, and care that the adjacent healthy structure be not exposed to contagion, are the first objects to be attained. Further than this the method may be largely a matter of individual preference, those most in vogue are: 1. Destruction *in situ* by caustics, such as the stick of nitrate of silver, pyro-gallic acid, the galvano-cautery, etc. 2. Enucleation with Volkmann's spoon, and cauterizing the walls of the cavity by either of the above, or what is, I think, better, carbolic, sulphuric or salicylic acid. In this latter procedure there is danger of reinoculating the patient, as well as of infecting the operator, for the tubercles are very vascular and blood is with difficulty prevented from entering the nostrils and mouth of the patient, while the apple-jelly contents of the tubercles readily spatters onto the operator's face, and may be inhaled by himself and his assistants.

To obviate this, about six months ago, I adopted the *thermo-cautère* of Paquelin. The result has been highly satisfactory, for the immunity is not only afforded to others, but by its use the destruction can be more thoroughly performed, and the walls of the cavity infiltrated with tubercle bacilli, although they offer a firm resistance to the scoop, hold out no barrier to the actual cautery. Even in the

milder form, lupus erythematosus, I believe the thermo-cautery offers the quickest and most efficient means of relief. In regard to the simple growths that lead to epitheliomata, their early destruction is the safest course, although the laity are thoroughly impressed with the *noli me tangere* sentiment, and frequently object to their removal until the most favorable time is passed. Papillomata of congenital origin, when on the face or where exposed to the friction of the clothing, should be removed early in life. For this purpose electricity offers the best means at our command. The process is known as electrolysis, and consists in the passing of the continuous current from one needle to another, which are thrust into the base of the growth. The strength should vary according to the size of the tumor, usually a battery of eighteen cells, or from ten to twenty milliampéres of current will be sufficient. This, when carefully performed, leaves no scar, and is devoid of the formidable procedure that necessarily surrounds the knife. In the papillary growths that appear later in life the same treatment may be adopted. For the small indolent ulcers that appear on the lips, as well as on other parts of the face, the pyrogallic acid (10 p. c.), salicylic acid in collodion (10 p. c.), or the Vienna paste, when applied early, will prove efficient in many cases. Seborrhœic plaques may be removed by escharotics, but electrolysis is to be greatly preferred.

Finally, when epithelioma is actually present, there are two methods which hold out the surest means of relief—electrolysis and the knife. My experience with the first leads me to believe, that thorough destruction along the channels of absorption can best be accomplished by its use, and that recurrence is less common than by any other method at our command.

THE PROGNOSIS AND TREATMENT OF NAEVUS PIGMENTOSUS.

By R. C. Longfellow, M. D., Cincinnati.

Prognosis. — The general term nævus implies all the congenital marks, spots, or moles which are present at birth, or may appear later on. Nævi are benign growths, but their presence or location may be the site of a malignant cultivation, just as trauma may sometimes cause malignant growths or degeneration. In some cases the nævi remain unchanged from childhood, then in middle life atrophy occurs spontaneously, or extensive degeneration. It is not uncommon for a nævus to remain unchanged for years, but during advanced age, irritation or accidental injury may occur, causing it to take on new life, and degenerate into a malignant tumor. The nævi in children have a rapid growth until about the tenth year; then, usually, the growth remains stationary for years, but seldom disappear entirely. Any tendency of nævi to become indurated in middle life should receive energetic attention, as melanotic sarcoma may eventually form from a degenerating nævus. Some of the most virulent forms of multiple cancer have their origin in nævi which have remained quiescent for nearly a life-time, then insidiously begin active degeneration. Some authors have found as high as seventy per cent of melanotic cancer of the skin came from nævi. Paget found in fourteen cases of melanotic cancer, ten had their origin in nævi. In middle age, nævi have been known to suddenly show signs of activity, grow rapidly, causing great disfiguration, or bleed to a dangerous extent. After

some months of such condition, these nævi may resume a quiescent state for a number of years, then again become active, finally degenerating into malignant tumors. The vascularity of some nævi being less than the normal skin inflammation, ulceration, or sloughing, can be easily excited by irritation, handling, or ineffectual attempts at removal. Sometimes part of the nævus may become atrophied by sloughing, contraction produced by cicatrix, but seldom is the atrophy extensive, or does the nævus totally disappear. Vascular nævi in the deep cellular tissue of the orbit are of special danger to the eye, causing destructive ulceration of the cornea, or pushing the eyeball from the orbit, which then must be enucleated. Nævi located on the lips, angles of the mouth, nose, breast, or penis, should receive radical treatment if any evidences of activity occur. On the penis, smegma may be retained under a tight prepuce, cause irritation, form a wart, which has been known to take on an epitheliomatous condition.

Of the different varieties of nævi, only two are apt to degenerate in advanced life, namely, nævus verrucosus and nævus lipomatodes. In men, nævi located on the lips are easily and often irritated into active growth in middle or old age by shaving too close, and by the use of tobacco, especially the constant use of the pipe. Nævi should never be rubbed, pinched, or pricked by instruments, as such irritation can produce activity often in what would be otherwise innocent growths.

TREATMENT.—If it is desirable to remove nævi maculæ, this can be done by the use of milder caustics, or escharotics. Weak solutions of chromic, salicylic, chrysophanic, or pyrogallic acid in collodion, or in ointments, each being used in its proper strength, will be sufficient. A three-per cent solution of the mercuric bichloride is an efficient application, used daily for five or six days, each application allowed to remain until a crust is formed. In a week's time this crust comes off easily, exposing a granulating surface beneath, which will rapidly heal under soothing

applications. Repeated applications in this manner will leave a small cicatrix, which, in time, nature, to some extent, obliterates. Scarification has been strongly advocated by Balamno-Squire, but in other hands has not proven so satisfactory. Tattooing with electric needle has been used by Fox in cases of superficial nævi, with good success, improving them all, but not effecting a cure in some cases. Extensive superficial nævi are not easily obliterated. To accomplish this, stronger solutions of acids and escharotics must be used, which leave a cicatrix as unsightly as was the nævus. Persistent and mild applications, such as green soap, will often greatly improve these nævi to a considerable degree, and lessen the deformity occasioned by their presence or location. The treatment of nævus verrucoses and nævus lipomatodes may be given under three divisions:

1. To stop nutrition.
2. Obliteration.
3. Entire removal.

Some nævi will require a combination of all the methods of treatment to secure desired results, as the individual case may require. Radical treatment should be given to those cases in which the nævi will cause disfigurement, each case receiving the special, as well as the severity of treatment indicated. In those cases where hemorrhage is impending or exists, or constant pain, the treatment should be radical, even more severe, if needed, than would otherwise be demanded to secure permanent results. The ten minutes allotted to this paper will allow only a brief mention of the treatment, divided as above. In the first division, anæmia and lack of nutrition can be accomplished by ligation or compression of feeding vessels; such compression may be effected on nævi lying over bony surfaces, or situated where they can be easily reached, as on the nose, forehead or cheeks. The duration of this treatment is long and usually unsatisfactory. In the second division, obliteration may be accomplished by parenchymatous injec-

tions, setons, puncture by cautery, or electrolysis. Such injections should be confined to the one agent, which has proven itself of the most value, namely, per chloride of iron, rendered neutral in solution. This remedy, injected into the base of the tumor, not more than two drops should be used at first, increased if needed, carefully, as the operation is repeated. Thrombus and contraction of the part, produced by the inflammatory action, causes the tumor to shrink; in some cases complete atrophy occurs. Often serious necrosis and suppuration of the skin occurs, while there is danger of embolism, not to be overlooked, which might occur if too strong a solution is used. Some deaths have been reported by injecting nævi with this agent. Holmes, who has used setons more than other authors, is a strong advocate of their use, passes two or more near the base of the tumor, allowed to remain until destructive inflammation occurs. In this manner some nævi will be cut through, slough off and the granulating stump heal satisfactorily. Cautery punctures, at red heat, may be made to the nævus often as necessary, until destroyed both by the cautery and subsequent inflammation. Electrolysis, most successful in the hands of Duncan, of Edinburgh, may be employed until radical cure is affected. This method is less dangerous than the injections mentioned, causes smaller cicatrix and less disfiguration. In the third division the entire removal can be done by escharotics, ligature and excision. Of the escharotics, the actual cautery or thermo-cautery, is the most useful of these agents. The thermo-cautery, bloodless, with little pain, will cut off the nævus at its base; in other cases, repeated applications will cause the nævus to shrink. The eschar produced will slough off in a few days, leaving a granulated surface, which can be healed rapidly. Caustic agents can be used when others can not be, or are contra-indicated; to lessen pain, local anæsthesia can be produced, either by spray or hypodermic injection, before the caustics are applied. The caustics most used are Vienna paste,

zinc chloride and chromic acid. Of these, chromic acid is best, because least painful, yet the eschar deep and penetrating. Any desired strength of this agent can be used in solution, or the crystals fused on a silver probe, applied to the nævus, repeated every sixth day until the desired result is obtained. Chromic acid does not produce as large a cicatrix as other caustics having the same power, for that reason is to be chosen. Salicylic acid and morphia sulphate in collodion will often give good results in smaller nævi. This mixture may be used with advantage on nævi about the eyes or lips, but its result is not as permanent as chromic acid. The use of the ligature is one of the oldést methods of treatment, spoken highly of by older writers of surgery. This method is rarely used now, because it is painful and slow. Excision by knife or scissors is an effective method, when the nævi are pendant and covered with normal skin. Caution should be used with these instruments, as often extensive hemorrhage has resulted; thus, when large tumors are to be removed, extra care should be taken to avoid or control hemorrhage. Bleeding should be arrested by ligation of larger vessels as they may be cut, torsion, styptics, or the actual cautery applied to the smaller vessels. The resulting stump should be healed by granulations, unless about the lips or eyes, when primary union is desired, on account of a smaller cicatrix. Any reappearance of the growth should be met with any or a combination of methods, that will give a radical cure in the individual case. The use of any or all the methods of treatment is to remove all the tissue and structures involved; to prevent, if possible, the recurrence of any growths on, or near the site of the former nævus. The loss of tissue is more extensive when caustics are used than follows the cautery or electrolysis, and, as far as practical, the latter agents should be given the choice in selection.

EPITHELIOMA OF THE LOWER LIP AND HAND.

D. J. MERRIMAN, M. D., PAINESVILLE.

Epithelioma is a disease of frequent occurrence, invading the skin and mucous membranes of the body, most frequently the face, lips, tongue, uterus, and bowels. It may be of slow or rapid growth, and result in deformity, destruction of tissue, and a lingering, horrible death.

I do not intend to enter into a discussion of the ætiology or pathology of this disease, but to urge the necessity of the early recognition and removal of all epitheliomatous growths, though they may appear benign. I think it is generally conceded that epitheliomas are, at first, a localized affection, and that an early removal of them is pretty sure to effect a cure. If this be so, how very important it is that we be able to recognize and remove these growths before the general system becomes infected. I report this case, which is only remarkable as occurring in an aged person, and the rapid recovery after removal. H. C., patient of Dr. E. B. Root, of Painesville, Ohio, a robust, healthy man, of eighty-one years of age, noticed, about two years ago, a nodule in the margin of the lower lip, which he thought was a cold sore, and which did not heal, but ulcerated, and gave him some annoyance, with but little pain. As he was a near neighbor, I noticed it very soon after it made its appearance, and advised him to have it removed in its early stage, which he declined, saying it would not amount to anything. It developed slowly until the first of last April, when it began to assume a malignant

appearance, and nearly doubled in size in the course of a few weeks. On May 22 I removed it by an operation devised by Szymanowski, and described in fifth volume of the International Encyclopedia of Surgery, figure 982. The entire lower lip was removed by incisions extending from the angles of the mouth to the point of the chin, making a V-shaped chasm. On each side incisions were carried from near the middle of these incisions, outward and downward to the lower edge of the jaw, thence backward and upward as far as possible, without severing the facial artery. These incisions formed lateral flaps, with their bases upward toward the cheek, and their free extremities below. These flaps were turned edgewise, so that their free extremities met in the median line, and thus formed a new lip. The lower part of the chasm was filled by other flaps, dissected from the subjacent parts. These flaps were closed with silk-worm gut sutures, and when united formed an almost perfect lip and chin. The parts healed by first intention, without an untoward symptom, and nearly all the sutures were removed on the fifth day. Had this growth been removed when first recognized it would have required only a trifling operation, and there would have been less danger of its recurrence.

I wish to again emphasize the necessity of an early recognition and removal of the disease. Cut wide. Better have some degree of deformity than a recurrence of disease. Of course, it is not possible to tell now what the final result will be, but it shows that we ought not to hesitate on account of the age of our patients, as my experience leads me to say that we may expect a good result, even in the very aged, if they are taken in time.

EPITHELIOMA OF THE HAND.

C. D., aged about sixty years, called at my office with a friend and showed me his hand, and asked for my opinion of it. I found on the back of the hand, over the first and

second metacarpal bones, a small nodular tumor, which I diagnosed as epithelioma, and advised him to let me remove it, which he declined. I then advised him to abstain from any irritating applications, and if it continued to grow to have it removed with the knife. He went from one to another, including a cancer doctor in Cleveland, but rapidly grew worse. He then went to Rome, N. Y., to a cancer cure, where he was told that there was no help for him without an amputation of the hand. He came home and sent for me to perform the operation, which I did in the middle of the forearm. He made a rapid recovery. I believe that had he allowed me to remove the nodule when I first saw it, he might have saved his hand. It has now been three years since the amputation, and there are no signs of recurrence.

R. P., aged fifty-seven years, had suffered with an epithelioma on his right hand for over two years, when I was called by Dr. E. B. Root, of Painesville, Ohio, to assist him in the amputation of the hand above the wrist. He had been treated by quacks and cancer doctors, until an amputation became a necessity to save his life. He also gave a history of a nodular tumor which might have been removed at an early date, and would have, undoubtedly, saved his hand, as well as a great deal of suffering.

There seems to be such a general fear of the knife, and a disbelief on the part of the patient that such an insignificant and harmless-appearing nodule or tumor can ever result in any serious consequences, that the golden opportunity passes, and loss of limb or other organ, if not of life itself, is the result.

Hoping that these few lines may be of service in directing your attention to this subject, and showing the need of early recognition and removal, I submit them to your consideration.

MELANO-SARCOMA OF SOLE OF FOOT.

By F. W. Langdon, M. D., Cincinnati.

Mr. President and Gentlemen — I have not a formal paper to present, but desire to report a case of melano-sarcoma, which is not only of interest, because of the comparative rarity of the disease, but on account of its, to me, unique location. The case occurred in the person of a gentleman, æt. 69, rather well-preserved and quite active for his age. He came to me some time during the month of May, this year, with a history of having had, three years or more before, a blood blister on the sole of his foot, so he described it, a dark discolored patch. At the time he presented himself to me it was rather larger than a silver quarter, beginning on the ball of the foot and extending back over the anterior margin of the instep arch. On the outer margin it was continuous, or flush with the skin, that is, it shaded off gradually into the surrounding skin. On the inner margin it presented three distinct eminences, two of which were pediculated. It appeared to me to be a papillomatous growth, and this diagnosis was more confirmed by consultation. Nevertheless, I advised immediate removal of the diseased tissues, to which the patient consented. I removed it by an elliptical incision, extending perhaps a quarter of an inch on either side of it. I removed it down to the deep plantar fascia, which left quite a cavity. The after-history of the case was uneventful, or has been so far. Union occurred without suppuration, notwithstanding the considerable tension and strapping required to get the tissues together. The man was on his feet in ten days, and went home in fifteen days without a cane, which he had used for some time before. An unusual feature about the case was

its location on the sole of the foot, and this is, perhaps, the only good reason for reporting it. Another thing was the slowness of its growth, three and a half years, with so little extension. And while this man had a number of nævi on the body, some as large as a pea and some larger, in two only was there any indication of pigmentation. He had no evidence of disease of the internal organs, or any multiple or secondary growths elsewhere. While we all know the extremely malignant character of the growth rather excludes hope for the future, yet, if there is anything in complete removal and absence apparently of secondary growths, I think we may consider, so far as infection from that focus is concerned, the patient need not have much fear. The prognosis may be considered more favorable because of the dense limiting fascia on its deep surface. No visible particles were left, and the growth was encapsulated and lobulated. During the operation the capsule was not opened. The mass was examined under the microscope, by Drs. Eichberg and Holt, of Cincinnati, who independently gave it as their opinions that it was a melanotic sarcoma. The specimen certainly leaves no doubt on that score in my mind. It has been my privilege to see three such cases, the other two being disseminated growths throughout the external surface and the internal organs. One was the celebrated case reported by Dr. W. H. Falls, ten or twelve years ago, in Lancet-Clinic, of a man who changed to a chocolate color, and the other case was equally disseminated, but the skin had not attained the dark brown color. The second case I saw through the courtesy of Dr. William H. Taylor, of Cincinnati, and whether it has been reported I do not know. In the case here reported, the situation of the growth on the sole of the foot and a history of blood blister, given by the patient, as well as the long duration without evident secondary infection, make it of more than ordinary interest.*

*December 30, 1893, at time of going to press, report from this patient by mail states that he is still in good health with no signs of return of growth, locally or elsewhere.

RECTAL STRICTURE OF PUERPERAL ORIGIN, RELIEVED BY LAPAROTOMY.

By N. Stone Scott, M. D., Cleveland.

Consulting Surgeon to the City Hospital; Visiting Surgeon to Charity Hospital; Professor of Genito-Urinary Diseases, University of Wooster.

It is with considerable trepidation that I offer to this Society, the *élite* of the medical profession of this great State of Ohio, in the words of Joseph Cook, "before whom I ought to stand dumb," a new classification of rectal stricture. The case I have to report to-day has been of special interest to me, and, on looking up the literature, seems to be unique. The consideration of the subject forces me to divide rectal stricture into *true* and *false*.

In a *true stricture*, the pathological narrowing is situated in one or more of the structures of the rectum.

By a *false stricture* of the rectum will be understood a stricture wherein the pathological condition is situated in the perirectal tissues, and not in the structures of the rectum. This must not be confounded with obstruction of the rectum, caused by a tumor or misplaced organ.

With true stricture, and with obstruction of the rectum, this paper does not deal. But it is my wish to show that false stricture not only exists, but may be better treated than by the methods recommended in the text-books. The case giving rise to this research is as follows:

Synopsis.—Symptoms of rectal stricture following confinement. Laparotomy. Recovery, with a complete cure of the stricture.

HISTORY.—Mrs. M., aged thirty-six years, a large, well-built woman, has always enjoyed good health until her last confinement. She first menstruated at seventeen years; periods have been regular in time and quantity, and accomplished without difficulty. She has given birth to four children; one ten years since, one six, the third three years ago, and one in April, 1892. All the labors were easy and convalescence normal, except the last. The first child died at the age of seventeen months, of diphtheria; the last one lived but twelve days; the other two are healthy. No trace of syphilis or gonorrhea in husband or wife. On the second day after confinement she complained of severe pain in the lower part of the abdomen, and on the eighth day a rectal tenesmus supervened, there being frequent passages of mucous streaked with blood. This continued some two months. Gradually the acute pain and bloody discharge subsided, but she did not regain her former good health.

Her doctor told her she had "grippe of the bowels." No vaginal examination was made. In July she consulted one of our leading gynæcologists, who put her to bed, gave her hot douches, and said to her, "You will have to stay in bed until the snow flies." For two and a half months she had no symptoms directly referable to the rectum, but after the latter part of August the difficulty she experienced in getting her bowels to move gradually increased in severity.

On the twenty-fifth of last October my father first saw the patient. At this time she was having a chill every day, or every other day, with a temperature from 100° to 101° F. The next week I saw her. She was then in a deplorable condition; her entire trouble was referred by herself to the difficulty in getting a passage, which she dreaded on account of the pain, and described as "something terrible," forcing her to bear down as if she were "going to have a baby." A movement was only secured by the repeated administration of large doses of a powerful

cathartic, and was accompanied by a distressing, burning sensation in the rectum, which could not be relieved. The anus, she said, would at these times "draw up toward the inside," while the passage was "very small, like a baby's." Her other symptoms were accompanied by a persistent anorexia, and daily vomiting, that threatened a speedy termination unless relief should be obtained.

A rectal examination revealed, at three and a half inches, a firm annular stricture, so small and resisting that the examining finger could not be made to engage in it. On making a vaginal examination the cervix was free, that is, as free as is possible with a fixed fundus. The fundus was retroflected, drawn to the left, and firmly fixed to the sacrum. Passing from the fundus, laterally, could be felt on either side a firm band, not sensitive to pressure, shorter and thicker on the left than on the right side. These bands occupied the site of the superior border of the broad ligament, passing off from either side of the uterus at its fundus, but did not extend throughout the width of the broad ligaments down to the cervix. Ovaries and tubes not to be differentiated.

November fifteenth, assisted by the house staff of Charity Hospital, in the presence of Drs. W. J. Scott, Weber, and Lucas, I opened the abdomen by a four-inch incision, with the expectation of, at least partially, relieving the rectum by freeing the uterus, lifting it up, and doing a ventrofixation. The uterus was retroflected, drawn to the left, and fixed to the sacrum; so firm were the adhesions, and to such an extent had the cicatricial contraction taken place, that the peritoneum of the fundus had a white, glistening, bloodless appearance. The left tube and ovary were not found, but their site was occupied by a mass of new connective tissue. The rectum skirted along the promontory of the sacrum, just above the fundus of the uterus, and dipped down into the pelvis to the right of that organ, instead of the left, where it is usually found. Commencing above to free the rectum, the vermiform appendix

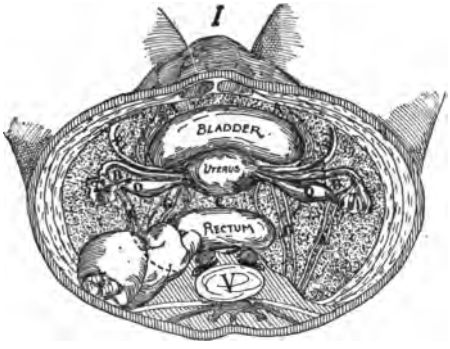
was found adherent to its anterior surface; this was freed, and being normal, was put over into its proper place. The tube and ovary, containing a small cyst which ruptured during the manipulations, were next lifted from the rectum. Very little ovarian tissue was left, the most of it being substituted by cicatricial tissue. The right broad, and the round ligaments were found to be much shortened; these, reinforced by the inflammatory new connective tissue between the rectum and broad ligament, formed a firm stricture of the rectum. The broad ligament, including the round ligament, was cut between forceps well down into "Douglas's pouch," and the anterior and posterior layer of peritoneum stitched together on either side of the cut. After stopping the oozing, and flushing the abdomen, the external incision was closed with silk-worm gut. A rectal examination showed that the stricture had been immediately relieved.

I have prepared a series of charts to illustrate the condition at the time of operation.

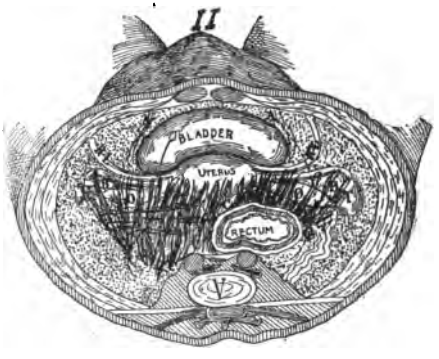
No. I, after Savage, I have modified to represent a transverse section of the body, showing the normal position of the fundus uteri, situated at about the center of the pelvic cavity, with the broad ligament and the structures contained therein; the ovary, tube, and round ligament passing out laterally to the pelvic walls.

No. II represents a transverse section of the body, showing the site of the inflammatory exudate and adhesions. This chart is largely hypothetical; as there was no vaginal examination for several months after the confinement, there is no way of knowing how much of an exudate there was during the earlier stages.

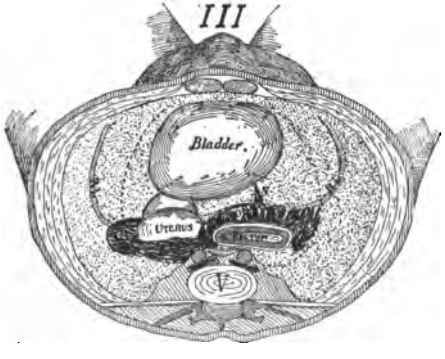
No. III represents a transverse section of the body, showing the relation of the pelvic viscera, in the case under discussion, at the time of operation. The rectum passes down into the pelvis on the right side, the uterus is drawn to the left, and fixed. To the left of the uterus is the short band of connective tissue, enclosing the remains



No. I.—Transverse Section of the Body, showing normal position of fundus uteri: A, hypogastric artery; A^1, spermatic vessel and nerve; B, broad ligament; C, sacro-uterine ligament; G, ureter; O, ovary; T, tube; R L, round ligament; V, last lumbar vertebra; dotted line indicates the true pelvis. (Modified from Savage.)



No. II (hypothetical).—Transverse Section of the Body, showing the site of the inflammatory exudate. References as in No. I.



No. III. — Transverse Section of the Body, showing the relations of the pelvic viscera in the case of Rectal Stricture of Mrs. M. RL, round ligament; C, cicatricial mass, including the left tube and ovary; O, right ovary, adherent to rectum, covered by new connective tissue; N, site of operation.

DIAGRAMS ILLUSTRATING A CASE OF RECTAL STRICTURE.

of the ovary, tube, and broad ligament. To the right of the uterus the broad ligament, passing from the fixed uterus on the one hand to the pelvic wall on the other, shortened and reinforced by the inflammatory new connective tissue, forms a firm band, pressing down upon the rectum, and preventing that organ from performing its natural functions. N. represents the site of the operation.

Convalescence was uneventful. One month after the operation I have in my notes the following: "Feels perfectly well. Can not get enough to eat, but suffers no discomfort from eating. As soon as her head touches the pillow she is asleep; first restful sleep since last April. Bowels move every day, and has taken cathartic but once since coming home." To-day, six months after the operation, she says that her health is better than ever before. Surely not the ordinary result of an operation for stricture of the rectum by the old methods!

The literature of the subject contains numerous cases of obstruction of the intestinal tract by bands of various kinds, some of them extending to the true pelvis, or even located in it; but the following three cases only may be fairly called false stricture of the rectum, although not so reported:

In 1854–55, Mr. T. J. Ashton* exhibited a specimen to the Pathological Society of London, showing "stricture of the rectum from a deposit of fibrous tissue external to its coats." "F., æt. 54, admitted to hospital with a history of disease of the rectum of twenty years' standing. Examination showed a contraction of the bowel to exist at three inches from the anus, surrounded by a dense mass of morbid structure. On post-mortem examination, the intestines were found greatly distended. No peritoneal inflammation existed. The rectum was contracted at the part already mentioned, and was surrounded by a large mass, having the appearance of fat, and very dense; but by the aid of the microscope, as well as subjecting the specimen to the

*Transactions of the Pathological Society of London, 1854–55.

action of ether, it was found to be composed of fibrous tissue alone."

January 11, 1893, Dr. Biggs* exhibited to the New York Pathological Society a specimen, of which he says: "It was removed from a woman thirty-five years of age. There were extensive adhesions from the upper border of the uterus directly backward to the rectum. It was interesting to note that the origin of the trouble was tubal. A firm band of fibrous tissue, nearly half an inch thick, surrounded the middle portion of the rectum, causing so much obstruction that it was with difficulty that the little finger could be forced through the opening. Above this point there was very marked dilatation of the gut, and in the sigmoid flexure and ascending colon there was very extensive diphtheritic inflammation."

Dr. Edwards† also reports a case found at post-mortem, in which "The cause of all the trouble was a cartilaginous band, about one and a-half or two inches wide, which had gradually occluded the gut completely from seven and a half to nine inches above the anus."

It is probable that most false strictures are due to an inflammatory process starting without the rectum. Dr. Biggs' case was apparently of that character, and my own was undoubtedly the result of such an inflammation.

That the latter was of puerperal origin there can be no doubt, as the history is clear on this point. None of the older authors mention the puerperal condition as an etiological factor of stricture of the rectum. Whitehead, even as late as 1888, in a lengthy address on stricture of the rectum, says: "I have no knowledge whatever of childbearing as a cause of rectal stricture." The modern authors are, however, beginning to recognize it as an etiological factor. Wyeths' and Moullins' surgeries contain the simple assertion that the "accidents of parturition not infrequently tend to stricture."

*New York Med. Record, February 4, 1893.
†New York Med. Record, April 21, 1888.

The differential diagnosis between true and false stricture is most difficult, since there is no pathognomonic sign or symptom. The clinical history of both are alike; a rectal examination reveals apparently the same condition. But if, on vaginal examination or otherwise, a pelvic band can be felt, especially if the uterus is fixed posteriorly, the stricture may be suspected as a false stricture. May it not be that quite a proportion of those found in women are false strictures?

Let us review for a moment the methods of treatment advocated for stricture of the rectum. They are, combined with constitutional treatment, the bougie, linear proctotomy, and colotomy.

The use of the bougie is not without danger, and even after the stricture has been fully dilated, the instrument must be passed at intervals to prevent its recontraction. Surely not a cure!

Of linear proctotomy, "The American Text-Book of Surgery" says: "It can not be practiced when the stricture is high up or of great extent; here we must perform colotomy to save the patient's life." The four cases forming the basis of this paper were from three to seven and a-half inches from the anus, and it is not improbable that most false strictures are high up, situated above the floor of "Douglas's pouch." Any operation through the rectum must not only cut through sound tissues, exposing them to the dangers of infection, but, if the operation is thorough enough to divide the constricting band, must also open the peritoneal cavity, which is *the* danger to be feared in linear proctotomy.

Colotomy is rightly a last resort; and, if a case judged to be a false stricture proves, on opening the abdomen, not to be directly amenable to surgical treatment, a colotomy can be performed, and the median abdominal incision closed, without materially adding to the dangers of the colotomy.

I have endeavored to show that there are cases of stric-

ture where the pathological condition is situated outside of the rectum. These I have denominated false stricture, in contradistinction to true stricture.

False stricture is usually the result of an inflammation starting without the rectum.

The puerperal condition is an important etiological factor.

Presents the same clinical picture as the true stricture.

Situated above the floor of "Douglas's pouch."

Theoretically, false stricture can be best treated by laparotomy.

APPENDICITIS.

By N. P. Dandridge, M. D., Cincinnati.

The object of the following paper is to present the subject of appendicitis to the Society for the purpose of eliciting a discussion upon the varying aspects of this disease, which so recently has assumed such practical importance, and which has attracted so much interest and work upon the part of physicians, pathologists and surgeons. I can not claim that my personal experience has been large enough to draw any individual conclusions from, but it has been sufficiently varied to convince me of the difficulty and complexity of many problems presented for solution in this affection, and the advantage to every one of enlarging their experience by learning the individual experience of others, such as a general discussion is like to evoke. As appendicitis is recognized as a dangerous disease, with a large mortality, but with also a large percentage of recovery, and as surgical interference has shown itself capable of dealing successfully with this affection, even in its most alarming form, the chief interest in this discussion must turn upon the question, at what time purely medical means should cease and when operative interference should take place; and further, what are the operative methods which experience has shown should be recommended. The question of when operation should be undertaken is the one of which there is most likely to be most marked divergence of opinion. The physician can point to a large number of cases in which a fortunate termination has followed where the symptoms have been persistent and most characteristic. On the other hand, the opportune interference of

the surgeon has undoubtedly saved many lives otherwise doomed. While the especial aim of the paper is to elicit discussion on the more practical aspects of the subject, a definite idea of the pathological changes present is necessary to an intelligent and comprehensive understanding of the questions involved in treatment. For practical purposes, all inflammations, whether acute or chronic, occurring in the cæcal region, may be considered as appendicitis. "Appendicitis," Osler defines, "as catarrhal, ulcerative and perforative, with the production of abscesses which may be pericæcal, pelvic, intraperitoneal, perinephritic or lumbar, depending on the situation of the vermiform process." Any of the forms may eventuate in abscess, the perforative, however, most frequently gives rise to suppuration, differing in the amount of pus produced, from a few drops to a pint or more, and which may remain circumscribed for an indefinite time, or may at once, or at some later period, develop a rapidly fatal general peritonitis. A small amount of pus may be found after evidence of disease has lasted for months, and the larger amount is sometimes developed within two or three days. Long-continued disease may give rise to a plastic exudation, which eventuates in a thickening or matting together of all the structure in the iliac fossa, so that cæcum, omentum, appendix and small intestine may be blended in an indistinguishable mass. Such a condition is most apt to occur in what the French term "chronic relapsing appendicitis," as distinguished from cases of recurring appendicitis, where an interval of good health exists between attacks more or less remote. Any form, however, may give rise to massive exudates without evident symptoms. The amount of exudation about the head of the colon may be so great and so firm as to give rise to a doubt as to whether a new growth does not exist when the parts have been fully exposed by incision of the abdominal wall. The situation of the appendix varies greatly. The last-named author quoted has found it in contact with the bladder, the ovary, the

broad ligament, the gall bladder, the sigmoid flexure, the promontory of the sacrum, the abdominal wall near the navel, and in the inguinal canal, and adherent to both colon and small intestine. Foreign bodies occasionally, and enteroliths frequently, are found within it. The condition in which the appendix is found is most variable. It may represent a flexible, thin-walled tube, lying free in the abdominal cavity, as much as nine inches in length, with a partial or complete mesentery, or its cavity may be partially or completely obliterated, and its walls so thickened that it reaches the dimensions of a finger or thumb, and is curved and bent upon itself in the most complicated way; or it may be distended, with pus or mucus, and present a pear-shaped body. In other cases, perforation, with an escape of a concretion or gangrene of a portion of a tube, most frequently near its tip, may occur after a few days' illness.

In the etiology of this affection, the presence of concretions and foreign bodies, typhoid fever and tuberculosis, traumatism, excessive exercise, constipation and indiscretions of diet, have long been recognized as important factors. More recently the investigation of Park and others would seem to indicate that the *bacillis coli communis* may play a most important rôle in the production of this affection, while actinomycosis has lately been shown by Ransom to be the cause of a perityphlitis. The tendency to recurrence is a marked feature of appendicitis in all its forms. Its especial danger is the development of a general peritonitis, which may occur so soon and so suddenly that the local pus formation can not be separated and distinguished from the general peritoneal infection, or may be indefinitely postponed, even where there is a large and growing pericæcal abscess. It should be distinctly understood that abscess formation and peritonitis may occur in the catarrhal form, where only thickening of the tube without perforation has taken place. Most frequently, however, perforation or gangrene is found, if suppuration is present, though

it is quite possible that the former may take place so gradually that adhesions will prevent and shut off the cavity from any infection. Where pus has formed, it may find its way to the surface, or may empty into any of the hollow viscera, in which case death from hemorrhage is an occasional termination. It is apparent from the above that the conditions the surgeon will encounter are extremely variable. In the catarrhal form he may find the appendix slightly or greatly distended, and free from all adhesions, or he may encounter an abscess of variable size, and not be able to find the tube at all. This abscess may be circumscribed, or may be part of a general peritonitis. Again, he may encounter a rupture or gangrenous appendix, or he may meet with a mass of adhesions so firm as to resist every effort to break them down.

The general course of the disease is sufficiently well known, but we may profitably consider briefly some of the more common symptoms. Of these, pain naturally first attracts attention. Most of the authorities speak of the onset as characterized by a "sudden severe abdominal pain," either with or without chill, nausea and vomiting, and lay stress on the value of these symptoms as indicating that rupture has taken place. Such has not been my experience, and the early pain, I think, is often far from severe, and it has seemed to me to be largely dependent on the abdominal distention, and to be most often referred in the beginning to the region of the umbilicus. There is, I think, reason to believe that rupture of the tube is at times followed by decided amelioration of most of the symptoms. This I think of great importance, and the following case is to the point:

M. T., a physician, æt. 27, after eating strawberries and cream at night, suffered the next day with what seemed acute indigestion with constipation. By the second day his fever had reached 102° F., and there was some fullness in the right iliac region and general abdominal pain. On the fourth day the fever had fallen to 100° F., the pulse

was less rapid, but the fullness in the right iliac region was more marked, though not very tender to pressure. The general condition and feeling seemed better, especially after a movement of the bowels by an enema. The day following there was still apparent improvement. On the sixth day the case was operated upon, because of the persistence and increase of the local swelling and resistance upon palpation, and the evidence of increasing sepsis. A large quantity of bad-smelling pus was found. The tube had ruptured, and a large concretion was found free in the peritoneal cavity. The tissues about the abscess were of a greenish hue, and extensive sloughs separated and delayed the convalescence.

Rupture in this case had most probably occurred early in the attack, and the pus formation had gone on in the presence of symptoms which seemed to indicate general improvement. The delay in this case was responsible for the prolonged convalescence, and a fatal termination was narrowly missed. Perforation may, I believe, take place not only without evident exacerbation of pain and other symptoms, but with an evident amelioration. It is possible to explain this from the fact that rupture may relieve the tension of the matter pent up in the appendix, and relief from this tension may be followed by a temporary cessation from pain and fever. Such has seemed to be the course in more than one case. This improvement is delusive. An increased severity of symptoms soon follows the enlarging focus of suppuration. Pain, on pressure, I have invariably found in the right iliac fossa, very variable in its severity, and by no means always at the exact point insisted on by McBurney. Palpation of the right iliac fossa discovers very variable conditions. An increased sense of resistance, not accurately defined, is the most common. A well-defined, sausage-shaped mass, often apparently superficially situated, generally means an enlarged and thickened appendix, which may or may not be surrounded by an exudation. I have generally been surprised at the depth

at which I have found tumors which seemed very superficial. A well-defined mass may, however, mean a blending together of all the iliac structures by adhesions, and when the long axis of this mass is parallel with the median line, the exudation has especially involved the walls of the colon, and these are the cases in which I have found the greatest difficulty in finding the appendix. The occurrence of a fullness, apparent to the eye and illy-defined to the touch, has indicated the presence of pus in considerable quantities. Œdema of the abdominal wall is, I believe, an almost certain indication of suppuration. I can not recall a case in which I could satisfy myself of fluctuation. I have a number of times been surprised at the increased prominence the tumor has assumed when anæsthesia was complete. This, of course, is due to the relaxation of the abdominal muscles, and justifies the use of an anæsthetic in cases of uncertainty, all preparations for operation being in readiness for use in case the diagnosis is established. Rectal examination has not seemed to me to justify the importance attached to it by many writers. Fever I consider an entirely unreliable symptom. I have found large quantities of pus with a pulse of 72 and a normal temperature. A sudden and marked rise of temperature, however, in the course of a case generally indicates the occurrence of some serious complication, such as abscess of the liver or pleurisy. In discussing the indications for operations, I must confess to a great deal of embarrassment. I am growing more and more favorable to early operation, but do not advocate operation in half the cases I see in consultation. Continuance and persistence of the symptoms I consider of special importance, especially the local symptoms, where the general symptoms have improved, as they often do after a free action of the bowels. I have never regretted operating, and I have been convinced that danger has been incurred by delay. If the patient is so situated that he can not be readily and frequently seen, I consider prompt action the safer course, and I have avoided serious

mistakes by this plan. On the other hand, I can recall cases where I thought the time had come for interference, but where the opinion of the consultation favored delay, and a fortunate result has ensued. Generally, I believe the decision arrived at is the correct one, and yet it is hard to give grounds for the "faith that is within you," and I have had to admit the apparent validity of the arguments offered by colleagues less actively inclined than myself, though still fully convinced of the correctness of my own position. I am sometimes inclined to think that, in appendicitis, "he who hesitates is lost." There are cases that I have no hesitation in saying the time for operation has not yet come, and I do not believe it will ever come. In others I am ready to assume the responsibility of the operation in the face of my opposition. In a certain class I hesitate, and circumstance and surrounding here play an important part in the decision. In this class I find myself, with increasing experience, constantly leaning more and more to prompt decision in favor of operation and against delay. In this connection it may be well for us to briefly consider just what it is that operation can accomplish in the various form of appendicitis.

These cases may be separated into three well-defined classes:

1. Acute appendicitis in the first well-marked attack. A favorable termination here may result in a permanent and complete cure.

2. Recurring acute appendicitis, with long intervals of perfect health.

3. Chronic relapsing appendicitis, where the local trouble never completely subsides, and where acute exacerbation occurs at short intervals. These cases are generally in a condition of chronic ill-health.

In the first class an operation may remove the appendix in an early stage, while the disease is strictly limited to the tube, and so avoid the danger which is always present from pus-formation in the peritoneal cavity, even where circum-

scribed. Nature, unaided, however, we must recognize, terminates a large number of these cases favorably. If pus has formed, an operation permits of its ready evacuation, and thorough drainage of the cavity will almost surely effect its rapid and permanent closure. In these cases the removal of the appendix removes the cause of further trouble. If it can not be found, further trouble may occur, but in the majority of cases the tube is obliterated and remains quiescent and harmless for the future. When heavy masses of exudate and adhesions exist, operation may remove the appendix, and with it the exciting cause of the recurring attack. In these cases, however, the surgeon may fail completely to isolate and find the appendix. In the presence of general peritonitis, operative interference is only able to most imperfectly fulfill the indications for the evacuation of pus, the disinfection of the cavity, and the securing of sufficient drainage.

I have but little to add in regard to the methods and technique of operations. In acute cases I have generally adopted an incision nearly parallel to Poupart's ligament. These are the cases where I have nearly always found pus. I seek to have my incision fall over the most prominent part of the tumor, most prominent to the eye and touch. When these do not correspond, I trust, by preference, to the sense of touch. In the more chronic cases I have found the incision along the outer border of the rectus preferable. When pus is found, I do not make a prolonged search for the appendix. I prefer to remove it, but think there is great danger in too much manipulation about the walls of the circumscribed suppuration. When there is no suppuration, but a mass of adhesion, I feel justified in prolonging the search, and in using a good deal of force in breaking up the resistant mass, so as to reach and remove the appendix. If you can once reach the surface of the colon in these cases, as Bull has pointed out, you can usually separate it without much difficulty. When you have pus in a recurring case, with adhesions, I am just

now very uncertain as to how it is best to act. I have recently lost such a case, a loss for which I do not feel entirely responsible, as the patient was removed from the hospital in the face of an earnest protest. In this case the pus cavity was first washed out, and then the mass of exudates and adhesions attacked, in the hopes of finding the appendix, but without success. I am not certain but the search was carried too far, and so facilitated the development of a general peritonitis. In these cases I would adopt, without reservation, the words of our President, where he says, in a recent publication: "So far as chronic recurrent cases of appendicitis are concerned, I believe most positively and unequivocally in operation, if necessary during an attack, but preferably in the intervals between the attacks."

In the treatment of the appendix stump, I have never attempted any of the elaborate methods which have been suggested. I have generally tied it with a moderately strong catgut ligature, and when possible have applied two or three stitches over the end, in the attempt to close in the mucous membrane. The wound I leave open and pack with gauze. In one case I brought the cæcum as near as possible to the surface, and anchored it by stitches to the edges of the wound, as I was apprehensive lest a fistula should form, as the appendix had been cut very close to the cæcum. Once only have I fully closed the wound, and then it was necessary to reopen it to allow the escape of pus.

I may refer to a recent experience of Richardson, of Boston. In two cases where the condition of the patients was so desperate as to preclude the idea of the usual operation, he punctured by the rectum, and evacuated a large amount of pus, with immediate relief. This course may be available in a limited number of cases.

I have not discussed the medical treatment at all. I may say, however, that I believe in the administration of morphine to the extent of controlling pain, especially if severe. The bowels should be emptied by an enema, and, if this

does not relieve the distension, by cathartics by the mouth; and these means must be repeated at intervals as necessary. An ice-bag kept continuously over the right iliac fossa gives relief.

I would present the following conclusions:

1. A considerable number of mild cases can be left to medical treatment.

2. Persistency of symptoms, or severity of onset, indicate the necessity for operation.

3. If pus is found in an acute case, a limited search for the appendix only is permissible.

4. Chronic cases should be operated on during an attack, if necessary, but operation during an interval is safer.

5. In cases with heavy masses of exudation and adhesions, if pus is present, tearing up the adhesions involves great danger of peritoneal infection; if not present, search for the appendix should be prolonged until it is found.

THE PATHOLOGY OF APPENDICITIS.

By J. C. Oliver, M. D., Cincinnati.

The American people have the reputation of being intensely practical in their mental operations; they do not, as a rule, waste time over the theoretical aspects of a question, but proceed at once to the practical features. The history of appendicitis in America lends color to this statement, for while a major part of the knowledge upon this subject is derived from American surgeons, we find that the question of treatment has been much better presented than the pathology of the affection.

No one can deny the practical results derived from such a course; but, at the same time, none can deny the value and necessity of a complete consideration of the etiology and pathology of this affection.

The very great uncertainty in regard to the nature and functions of the appendix is a stumbling block which forbids free entrance to an intelligent consideration of the subject. Is this organ merely a superfluous attachment, and an evidence of evolution, or is it of service in the animal economy? Its constant presence in the human organism would seem to cast doubt upon its merely evolutionary importance, for the economy of nature is such that she wastes no time or energy upon useless appendages. Organs which are not of use soon become rudimentary and atrophied, but this does not apply to the appendix vermiformis.

"The structure of the appendix is similar to that of the large intestine; from without inwards are to be found the

peritoneal investment, long, smooth, muscular fibers, circular fibers; then a tolerably thick layer of cellular tissue, with arterial openings and lymphatic depressions; then a mucous coat, doubled with a thin 'muscularis mucosæ,' and lined with a cylindrical epithelium. The appendix is composed of glandular tissue, which is found in spots of flat or round follicles." (*Annals of Surgery, January, 1893, p. 89.*)

From this histological description, one readily arrives at the conclusion that the appendix is, in reality, a gland. Retterer likens the appendix to a tonsil. Should this view prove correct, we can readily believe that the function of the appendix is to produce mucus for the lubrication of the cæcum. In the female there is a lymphatic communication between the appendix and the ovary.

If this view of the nature and function of the appendix is correct, and from its histological elements we are seemingly forced to the above conclusion, what, then, is the pathology of the affection? To say that it is an inflammation of the appendix is begging the question. What causes the appendix to inflame? Does the trouble always begin on the mucous surface, and by extension involve the other layers? If the inflammation is caused by a foreign body in this tube, whence comes the body, and how does it produce the conditions found in these cases?

As a usual thing the first symptom noted is the onset of acute pains, generally limited to the right iliac region. The pain is similar to that of colic, in that it is paroxysmal and severe. So far as we can judge, the colic marks the beginning of the process. Experience in these cases seems to have established the direct relation between the passage of a foreign body into the appendix and the onset of acute pain. The first step, then, probably consists of the passage from the cæcum into the appendix of this body, and the pain must then be caused by the irritation of this body upon the sensitive appendix.

Before passing to the direct cause, let us stop for a few

moments and examine some well-marked predisposing causes. Age is a very important predisposing cause. All the statistics I could obtain seem to show that at least seventy-five per cent of these cases occur under the age of thirty. Bamberger gives the proportion as seventy-two per cent, and Reginald Fitz gives it as seventy-six per cent. The decade showing the greatest number of cases is that from ten to twenty years; next, from twenty to thirty years. In infancy, middle and old age, the affection is rare.

Sex is another important predisposing cause. Males suffer four times more frequently from this disease than do females.

It seems to me that constipation as a causative factor has been greatly overrated, and the comparative immunity of females lends great weight to this view. We all know that females between the ages of ten and thirty years are, almost without exception, constipated, and were constipation an important factor, they should furnish the majority of the cases. That they do not is sufficient evidence upon which to rule constipation out of the role of even a contributing factor. Besides, constipation is a very misleading term; most people are inclined to believe themselves constipated unless diarrhœa exists.

Age and sex then appear to be the only tangible predisposing causes with which we are familiar. I know of no investigations relating to differences between the male and female appendix, nor am I acquainted with data showing a marked difference between the appendix in adolescence and that in middle or advanced life.

The mode of formation of the foreign bodies is an exceedingly interesting and obscure process. When foreign bodies, which have been swallowed, are the cause, we need not waste time over that question, but my own experience and my reading have convinced me that, in the vast majority of cases, the offending body is a fecal concretion; a dry, hardened, laminated fecal mass. I have never found cherry-seeds or other similar matters to be present. Possi-

bly these concretions are the result of a catarrhal inflammation of the mucous membrane of the small intestine; possibly they consist of particles of undigested food. Apparently, we must be content, for the present, to acknowledge that we do not know the method of their production; in fact, we can not say positively whether they are produced in the intestine or in the appendix itself.

The manner in which concretions in the appendix produce inflammation and perforation of that organ is more simple and requires no elaboration. The foreign body is the irritant which produces an irritation of the mucous membrane; this membrane then receives an influx of blood, causing a swelling around the foreign body; the swelling produces a constriction of the vessels, and the constriction, when of sufficient amount, produces a gangrene and perforation of the appendix.. The part most distant from the center, *i. e.*, the free end of the appendix, is the first to feel the stagnation; hence, in a majority of cases of perforative appendicitis, we find the extremity presents the opening. The perforation does *not* always correspond to the part in which the foreign body is impacted.

After perforation occurs, and the contents contaminate the peritoneum, there is set up a peritonitis, either general or local. Should the peritonitis be local, and remain so, it must be regarded as a conservative and helpful process, for the adhesions thus formed shut off the general cavity from infection, thus producing a cavity which is limited by the adhesions formed; thus an abscess is formed which is *practically* outside of the peritoneal cavity. Should the peritonitis become general, the chances for recovery are very greatly reduced.

The pain, which is a prominent symptom of this disease, is a very interesting feature, but the time will not permit of anything more than condensed statements upon this point. Pain is usually the first symptom which directs our attention to this disease; it is described as colicky, intense, and more or less paroxysmal; it is usually localized in the

right iliac fossa, but may be quite diffuse; it may even be referred to the umbilical region. It is quite probable that this pain is produced in much the same manner as the pain in hepatic or renal colic; the efforts of the appendix to expel the offending substance cause the exacerbations. We may then, with truth, speak of an appendicular colic. Binnie, Kammerer and Von Hochstetter report cases which go to prove the correctness of this view of the manner of production of the pain. A further fact, which adds to the probability of this hypothesis, is that perforation of the appendix and relief of pain are synchronous. The pain, in the later stages of the disease, is produced by peritonitis, and differs in character from that present in the early stages.

The production of pus after perforation is not difficult to account for, when we consider the swarms of bacteria constantly present in the intestinal canal.

From this hasty and very incomplete review of the pathology of the affection we can, I think, learn some very important facts in regard to treatment.

1. In some cases the efforts of the appendix to expel the concretion are successful, the foreign body being forced back into the cæcum. These are, in all probability, the cases which are called "catarrhal," and spontaneous recovery is the rule. (Appendicular colic.)

2. The continuance of the colic may be taken as an evidence that the appendix has not been perforated as yet, and operations done during the continuance of the colicky pain will have for their purpose the simple removal of an inflammed but intact appendix.

3. After perforation has occurred, it is the part of wisdom to delay operation until firm adhesions have formed and the general cavity is shut off.

4. After operations, undertaken before perforation has taken place, the belly may and should be sutured tightly. After perforation and suppuration, the incision should be

left open, and the part treated as an abscess elsewhere is treated, *i. e.*, by drainage and irrigation.

There is also a tubercular form of inflammation which affects this organ, but this, I take it, is foreign to the scope of this discussion; hence, it has not been considered in this connection.

INFLAMMATION IN THE RIGHT ILIAC FOSSA, AND ITS NON-SURGICAL TREATMENT.

F. D. CASE, M. D., ASHTABULA.

Inflammation occurring in the right iliac fossa is one of the most frequent and important of intestinal affections.

While some confusion still exists as to its pathology, it is now pretty generally conceded that the appendix vermiformis is usually the part diseased.

It is true that authors still recognize typhlitis (inflammation of the cæcum), associated with the lodgment of fæces (typhlitis stercoralis), yet, as these cases are never found on the post-mortem table, or come to operation, the anatomical condition is practically unknown, and their frequency has probably been greatly exaggerated.

Perhaps it will be well to review, briefly, the normal anatomy of this region, since the teaching of the older anatomists has been proven erroneous.

The cæcum is the most dilated part of the larger intestine, measuring about two and one-half inches, both in its vertical and its transverse diameters. While its position varies somewhat, it is usually found lying upon the psoas muscle, "its lower point corresponding to a point a little to the inner side of the middle of Poupart's ligament" (Gray).

Attached to its lower and posterior portion is the appendix vermiformis, a long, narrow, worm-shaped tube, three to six inches in length, and of the average diameter of a No. 9 catheter, Eng. scale. From two hundred dissections, Ferguson found its average length to be four and one-half inches. It was absent in only one instance. It is usually

directed upward and inward behind the cæcum, twisted upon itself, and terminating in a blunt point. Its canal communicates with the cæcum by an orifice that is usually guarded by a valve.

The lower end of the ileum terminates at the inner and back part of the large intestine, at the junction of the cæcum with the colon. At this point the mucous membrane projects into the large intestine, forming two valvular folds, separated from each other by a narrow, elongated, slit-like aperture, directed transversely. The researches of Treves, Ransohoff, Fitz, and others, have shown us that both the cæcum and its appendix are entirely covered with peritoneum, and that, as a result, they are both intra-peritoneal viscera. This is contrary to the older teaching, which was, that the posterior part of the caput coli is destitute of peritoneum, and is attached to the fascia, covering the right iliacus muscle by areolar tissue.

The peritoneum, after investing the cæcum, is reflected on the posterior wall of the abdomen, forming a meso-cæcum, which is continuous with the meso-colon, when that fold exists, which occurs in about twenty-six per cent of the cases examined. The cæcum, therefore, lies quite free in the abdominal cavity, and capable of a considerable amount of motion. The normal appendix also has a distinct mesentery, by which it is attached to the under layer of the mesentery of the ileum. In the fœtus the mesentery extends to the tip of the appendix, while in the adult the distal half-inch, or more, is free from mesenteric attachment, and is, therefore, movable.

The appendix often shows post-mortem evidence of extensive disease, when there has been no history of definite symptoms during the patient's life-time. Thus, Toft states that in three hundred personal observations, every third person between the ages of twenty and seventy shows trace of inflammatory trouble, past or present, in the appendix, and that actual ulceration existed in five per cent. Ransohoff thinks the figures given too large, espe-

cially in this country, as in over sixty autopsies he found evidence of disease in about twelve per cent.

In the light of present knowledge, we may fairly assume that appendicitis usually originates in a catarrhal inflammation of the mucous membrane, leading to a thickening of Gerlach's valve, or permanent stenosis of the appendicular orifice; "then follow accumulation of secretion, distention, and, frequently, ulceration."

This may result in the partial or complete obliteration of the canal of the appendix, or in perforation. "Stenosis of the canal, with retention of the secretions, frequently results in the formation of a calculus, the nucleus of which may be a speck of hardened fæces (or sometimes a foreign body), around which the mucous collects, receiving sometimes, in addition, a deposit of phosphate or carbonate of lime." In fatal cases of perforating appendicitis, a concretion or foreign body is found in about seventy-two per cent. In the event of perforation, a general diffuse peritonitis may ensue, or, as most commonly occurs, a circumscribed peritonitis results, forming a tumor.

Inflammation may now subside and resolution take place, or suppuration may result, the abscess opening into the intestines, the vagina, or the bladder, or through the abdominal wall; or it may break through the circumscribed boundary, and escape into the general peritoneal cavity. "The inflammation then may cease at any point, from its origin in the mucous membrane to its diffusion to the whole peritoneal cavity" (Fenger).

Wier gives the following as the result of one hundred autopsies: In eighty-four cases the appendix was perforated, in three inflamed and not perforated; in four the cæcum was perforated, in two of which the perforations were due to abscess opening into the cæcum; in nine the condition of the cæcum and appendix was not stated. As to the site of the abscess: in twenty-two it was intra-peritoneal and circumscribed; in thirteen intra-peritoneal with general peritonitis; in fifty-seven general peritonitis with-

out abscess; in four there was an extra-peritoneal abscess; in ten the condition was not stated. In only one case was the cæcum more than ordinarily filled with fæces.

Age and sex appear to stand in a causative relation to disease of the appendix, as eighty per cent of the cases appear in males, and twenty per cent in females. Seventy-six per cent are under thirty years of age, and fifty per cent under twenty years. Under six and over forty the disease is comparatively rare.

I am not aware that a satisfactory explanation has been given for the greater frequency of the disease in males, but, from my own observation, I am inclined to the opinion that traumatism, violent exercise, or unusual exertion, are more frequent causes than has heretofore been supposed. In four of my cases this was the cause assigned by the patient for his illness. Fæcal concretions and foreign bodies probably play the most important role in the production of the severer forms of the disease, since they have been found in about sixty per cent of the collected cases. It is not probable that constipation alone often causes the disease, or we would find it more frequently in females than males, while the reverse is the case.

The disease is frequently recurrent. According to Fitz, among 257 cases, eleven per cent had had previous attacks. In a subsequent series of seventy-two, it was recurrent in forty-four per cent. "In the recurrent form, no factor is of greater importance than over-eating, and attacks may follow directly upon the taking of large quantities of unsuitable food." Dr. McBurney reports the case of a young lady who, in the course of a little over a year, had no less than twelve attacks of so-called perityphlitis. These had been severe, with great pain and rise of temperature. At the operation, done to prevent recurrence, the appendix was found rigid and swollen, the mucous membrane mildly inflamed, the other tissues of its walls greatly thickened. Not the slightest evidence of peritoneal inflammation or adhesion existed.

A study of collected cases has established the fact that certain definite symptoms occur in almost constant sequence. The onset of the disease is usually sudden. Pain in the right iliac fossa is usually the first symptom, and is sudden and severe; or there may, at first, be general abdominal pain, becoming local after a few hours. It is increased by coughing, by deep inspiration, and by effort to extend the right leg.

Vomiting is also an initial symptom; the ejected matter consisting, first, of the food contents of the stomach, later of bile. If general peritonitis develops, the vomiting may become projectile in character. It is usually aggravated by taking food.

There is usually tenderness at McBurney's point, and later general abdominal tenderness. The abdomen becomes rounded and tense, in consequence of the paralyzed intestines being distended with gas. There is small, feeble pulse, dorsal decubitis, rigidity of the abdominal muscles on the right side, and flexion of the right thigh upon the abdomen.

The temperature varies from 101° or under to 105°, and should always be taken per rectum, since, in acute abdominal disease, there is often a difference of two or three degrees between the temperature of the mouth and axilla and that of the rectum; and Stimson reports a fatal case of appendicitis, where the temperature in the mouth was 99.5°, in the axilla 98.6°, while in the rectum it was 105.5°.

Constipation is usually present from the beginning of the disease, and there may be symptoms of intestinal obstruction. This is explained in many cases by the position of the appendix behind the cæcum and ileum, so that when inflammation develops there is a pressure of inflammatory products on the ileum from behind and below. Ransohoff reports twelve cases, in which perforating appendicitis produced all the manifestations of intestinal strangulation.

In this connection the following case is of interest, on account of the rarity of some of the symptoms, and the difficulty of correct diagnosis:

Ed. B., aged 18 years, was first seen May 17, 1881. Three days previously, while engaged in athletic sports with some companions, he felt, as he expressed it, something give way in his abdomen. He at once returned home and went to bed. He complained of severe abdominal pain, referred to the region of umbilicus, of nausea, and this was soon followed by free vomiting. On the following morning a homœopathist was called, who diagnosticated typhoid fever. Patient continued to grow worse. I saw him the third day of his illness; condition as follows: pulse 110, temperature 102.6°. Complains of severe pain, diffused over entire abdomen, which is enormously distended and tympanitic. No dullness anywhere on percussion. Patient complains of extreme tension, says he will burst open; can feel the parts tearing, and like expressions. Bowels have not moved since illness began. No nausea at present. Gave hypodermatic injection of morphia at once, and ordered an enema to evacuate the bowels, to be followed by enemas of laudanum in starch water, as needed to relieve pain and restlessness; hot turpentine stupes to abdomen; aconite and belladonna, oxalate of cerium. On the following day patient much the same; is clamorous for an operation to relieve him. Treatment continued. On the fourth day, being the seventh from the beginning of illness, bowels were moved by copious enema. Patient from this time gained slowly, being discharged May 29, the fifteenth from beginning of illness. No tumor or dullness of abdomen was at any time discovered. On June 19 I was again asked to see this patient, who was said not to be "as well." Two days previously he had attended a pic-nic, and indulged his appetite too freely. That evening he had pain in the abdomen; nausea and slight vomiting; abdomen somewhat tympanitic. A copious enema was to be given, followed by an enema of starch and laudanum to relieve pain; hot turpentine stupes to abdomen, and oxalate of cerium for nausea. After three days a passage of the bowels was secured, and patient again began to improve. On the tenth

day indiscretion in diet again caused a return of the pain, nausea, and obstruction of the bowels. From this time the patient rapidly grew worse. All efforts to secure a passage of the bowels were futile. The vomiting was projectile in character. The vomitus was of the consistency of gruel, and the color of Paris green. The pulse was small and feeble, and everything pointed to an early death. After ten days there was a spontaneous evacuation of the bowels, and the vomiting ceased; but from this time we had many of the symptoms of chronic septicæmia, the most distressing of which was a burning pain extending the whole length of the spine, which was relieved by the application of ice water to the back. During this period the temperature ranged from 100° to 102°. By August 1 the patient was slowly improving. There was now, in the right iliac fossa, a well-defined tumor of the size of a large orange; it was sensitive to touch, and sufficiently painful to require the daily use of opiates. The appetite, however, was fair, and the bowels were opened readily by the use of enemas. September 5 he was seen by a prominent surgeon, who diagnosticated cancer (an opinion in which I did not concur), and advised the free use of opiates, and pill of ext. cicuta. January 4 fluctuation was evident, and five days later there was a free discharge of pus, at a point just above Poupart's ligament. From this time improvement was rapid. Patient rapidly gained flesh and strength. A sinus, however, remained for nearly a year, when that, too, closed, nearly two years from the beginning of the illness. Of thirteen cases seen by myself, nine terminated in resolution, and four in abscess. In two cases the abscess ruptured through the abdominal wall, and in two cases into the intestine. Fortunately, all recovered. An analysis of forty-seven cases occurring in the practice of eight leading physicians of North-eastern Ohio, together with my own cases, gives the following result: Total number of cases, 60. Males, 45; females, 12; not reported, 3. Under 10 years, 5; from 10 to 20 years, 16; from 20 to 30 years, 21;

from 30 to 40 years, 13; over 40 years, 5. Operated upon before fifth day, 6; after fifth day, 6. Appendix removed in five cases. Deaths after operation, 6; deaths without operation, 9. Recurrent cases, 10. Terminated by resolution, 30; by abscess, 30; opening into the intestine, 11; opening externally, 7.

REMARKS.—One case aspirated per rectum; three pints of pus removed; recovered. Two opened into peritoneal cavity, with death from peritonitis. Operation pending in one case.

"Early recognition of disease, and accurate diagnosis, constitute two important steps toward successful treatment" (Hilton). This is especially true of patients suffering from peritonitis, who die, generally, "not because management of the disease is not understood, but because it is not recognized sufficiently early" (Musser).

If a case is ushered in with fever, pain, and other typical symptoms of the disease, a prompt and energetic therapy must be resorted to, and perhaps first in importance is absolute rest. The patient should be immobilized as far as practicable; urination and defæcation being accomplished with the greatest care and freedom from motion. Opium should be administered early, in anodyne doses, not only to prevent pain, but also peristalsis, and to secure physiological rest. Hilton, in his classical treatise, has demonstrated the importance of rest in surgical diseases, but its equal importance in many forms of non-surgical diseases seems to have been entirely ignored.

If seen a few hours after the onset of the disease, an enema (preferably of magnesia sulphate and glycerine) may be given, to evacuate the large intestine.

Perhaps next in importance after rest and opium, is local blood-letting. Three to fifteen leeches, applied over a limited area, of which McBurney's point is the center; these to be followed by hot fomentations. Champagne, cracked ice, and a solution of cocaine in lime water or mint water, will help to relieve nausea, but even here opium is of first

importance. Aconite or other non-nauseating heart sedative may be employed if indicated, as in other inflammatory conditions. Liquid diet should be rigorously insisted upon, until convalescence is fully established. "If the disease process has not yet passed the stage of engorgement, or incipient inflammation, it may be, and often is, stamped out within the first forty-eight hours." In fact, "so long as the abscess cavity remains limited, resolution is possible." All the cases seen by the writer within twenty-four hours of the inception of the disease, five in number, have, by a rigid adherence to the treatment already outlined, terminated by resolution.

Protracted high temperature, and a corresponding severity of the other symptoms, is not a bar to successful medicinal treatment, as is instanced by the following case: Kittie R., æt. 6 years; ill for twenty-four hours. During the last twelve hours there has been nausea and vomiting. No passage from the bowels since the beginning of the illness. Pulse, 130; temperature, 103°. Abdomen distended and typanitic, save over right iliac region, where there was dullness on percussion. Pain severe. Knees drawn up. An attempt was made to administer an enema, but it caused so much pain that it had to be discontinued. For the first twelve days she was very ill, the temperature never falling below 102°, for several days reaching 104°, and on one occasion 105°. The treatment was leeches, followed by hot fomentations, absolute rest, liquid food. For several days aconite was given, and, later, stimulants. Pain was relieved by laudanum, or morphia, per rectum. Up to the twelfth day the abdomen was enormously distended and tense, when an enema was cautiously administered, the bowels were moved, and the flatus much diminished. A well-defined tumor could now be felt in the right iliac fossa, the size of a small orange. From this time convalescence was gradually established, and patient was dismissed on the twentieth day, with tumor somewhat diminished in size.

Although, just now, operative interference is in the ascendancy, yet when we are told that all cases that do not at once improve should be treated with the knife, is it not time to draw the line, and, in the language of the day, inquire "where we are at?"

A prominent authority says: "Operative interference is indicated, in mild cases, if medicinal treatment fails within twenty-four hours to decrease pain, pulse, temperature, tumor, and tympanites" (Ashton).

A prominent surgeon recently, in a clinical lecture, said: "An abdomen swollen with peritonitis looks to me like a great big ripe boil, and needing the treatment that boils usually receive." And further: "The presence of a lymph-cake in the vicinity of an appendix vermiformis is the signal of the peritoneum for help, and the sympathetic surgeon must respond instantly, bearing in his hand the little wand that will vanquish the witch" (Morris).

While the question as to the indications for operation must still remain *sub judice*, I would suggest the following, as embodying our present knowledge:

Operation is indicated:

First: In the fulminating form, where there is a sudden onset of the disease, with grave symptoms, intense diffuse abdominal pain, excessive tympany, frequent feeble pulse, threatened collapse, vomiting, great restlessness.

Second: When the symptoms above detailed come on suddenly, in a patient previously in good condition.

Third: In a case where a large, tender induration develops suddenly with high fever.

Fourth: In recurrent appendicitis, when previous attacks have been severe; at the beginning of an attack.

Fifth: When there is pus in the abdominal cavity, or in a tumor adjacent thereto.

As a rule, operation should be resorted to only in the early course of the disease, or when there is a well-defined abscess. Only perforation or rupture of an abscess into the general abdominal cavity would justify the intermediate operation.

In conclusion, I can not forbear quoting the language of Prof. Parvin, in the presidential address at the late meeting of the American Gynecological Society. In speaking of an analogous condition, he says: "I would not disparage the brilliant results obtained by abdominal section in pelvic suppurations, and I recognize among American operators many as able and successful as any in the world; at the same time, I would gladly see their work much more limited, as I believe it can be when medicine asserts its prophylactic and curative powers, as it surely will in the progress of our knowledge."

NOTES.

Fitz Cases.—In the last four years, from 72 cases, the following conclusions can be drawn: Twice as many males as females are affected; recurrent attacks show a percentage of 44 (11 per cent only in the larger number collected previously); 74 per cent recovered; 26 per cent died. One-half treated surgically, 40 per cent died. One-half medically, 11 per cent died.

Spontaneous evacuation of pus took place in 7 per cent of cases. Surgical treatment in severe cases does not shorten the period of illness. (Fitz, Annual of Medical Science, Vol. 1, 1891, page D 11.)

Resolution and Pus.—Dr. Janeway remarked, in discussing a case reported by Dr. J. Lewis Smith (*Medical Record*, Vol. XXV, 1884, page 470), "that when an abscess is formed it does not necessarily kill directly. He then referred to a case in which an abscess was found in the right iliac fossa, with perforation of the appendix, that had probably existed for three or four months, as there was remaining only a small cheesy focus. Besides, there were found multiple abscesses of liver and brain."

Suppurative without Perforation.— Dr. Peabody reports (*Medical Record*, Vol. XXVII, 1885, page 442) a case of abscess without perforation of the appendix: "It was soft

and friable and contained a concretion three-fourths of an inch long, and as large as the prong of an ordinary dinner fork."

Saundby Cases.—Dr. Saundby records (*Birmingham Medical Review*) a series of fifteen cases of perityphlitis, only one of which was subjected to operation, and this was the only fatal case.

He does not believe it is possible to distinguish between cases in which the appendix is really the seat of inflammation and those in which it is not, nor does he think it of the least practical importance. The occurrence of high temperature is no bar to successful medical treatment, as was instanced by two cases.

Noyes, in his paper read before the Rhode Island State Medical Society, in 1882, mentions a case reported by Dr. Edson where the formation of an abscess was indicated by chills, pointing, and a temperature of 103° to 104°. The case terminated suddenly by absorption.

Fatality.— Noyes investigated 100 cases treated by incision, in which the mortality was 15 per cent.

Resolution.— "If there be a simple accumulation of pus without perforation, without its having become polluted by foul gases or the decomposing contents of the intestine, it may terminate by dissipation, degeneration, inspissation or absorption." (Manley, *Anchives for Gynecology and Pædiatry.*)

Fatality.— "Two-thirds of the collected fatal cases of inflamed appendix, under whatever term they may have been designated, proved fatal during the first eight days. One-half of them died in the latter half of this week." (Fitz.)

Peritoneal Sepsis and Septic Peritonitis.— "It is important to distinguish between peritoneal sepsis and diffuse peritonitis. In the former an enormous development of septic, irritant matter occurs in a cavity, the absorbing power of which remains unchanged, the septic products are not prevented from entering the system through the large lymph

spaces. In purulent peritonitis, however, there exists an inflammatory condition of the serosa, and the lymph spaces are early occluded. Thus, in peritoneal sepsis, therapeutics are hopeless. In purulent putrid peritonitis the degree of general infection determines the result." (Witzel of Berne, Surgical Section 61, Congress of Naturalists. *News*, Vol. 53, page 560.)

Musser's Cases.— Musser reports (*University Medical Magazine and Annual Medical Sciences, 1890,*) 11 cases of acute peritonitis, due to disease of the appendix, that recovered without operation. The treatment was:

First.— Local blood-letting, three to fifteen leeches; in more advanced cases a blister, followed by hot fomentations.

Second.— Liquid diet; stimulants when necessary; also cracked ice, lime water and champagne.

Third.— Calomel in small doses hourly until bowels are moved, continued to ptyalism with opium. An enema of warm sweet oil and warm water if calomel does not act.

Fourth.— Aconite for children, veratrum viride for adults, until pulse is reduced.

Fifth. —Morphia and atropia to relieve pain.

Sixth.— Stimulation by hypodermic injections of whisky, digitalis, atropia.

Sands' Cases.— Sands (*Medical Record*, Vol. 13, 1878, page 55) gives an analysis of 20 cases in his own practice, with the following result:

"Resolution occurred in seven cases; recovered after operation (*i. e.*, opening abscess), eight cases; recovered after rupture into bladder, one case; recovered after rupture into rectum, one case; died after opening abscess (during tenth week), one case; died after unsuccessful attempt to reach the abscess, one case; died without operation, of secondary meningitis, one case."

In reviewing his experience, Dr. Sands remarks that the chances of spontaneous recovery by resolution are not to be lost sight of, but ought to be carefully estimated in every case before deciding the question of operation. Usually,

the fortunate result (resolution) had followed the use of opium, leeches, and fomentations, which he regarded as the most valuable means of treatment.

Aspiration.—Dr. John Homans (*Medical Record*, Vol. XXIX, 1886, page 496), in speaking of a case upon which he operated successfully, says: "If I had thrust in the needle at the point where I made the incision, I should have perforated the bowel at least four times before I could have struck the collection of pus, and I might have missed it entirely."

Tolerance of Peritoneum.—There are many experiments besides those quoted to-night, shedding a flood of light upon the subject, which show that the peritoneum can take care not only of fluids or foreign bodies, but even of pathogenic organisms and fæces, provided that the quantity introduced during a given times does not exceed a given limit. If all the material can be absorbed in an hour or two the animal is safe. (Nancrede, *Medical News*, Vol. LIII, page 653.)

With's Cases.—In 1880 With presented a series of 30 cases treated from the beginning by himself, or his colleages, after the ordinary method, with the result of 40 per cent of deaths.

In 1884 he again reported a series of 50 additional cases, similarly met with, of which only 16 per cent died. His treatment, however, was entirely different. Purgatives, rectal injections, etc., were sedulously avoided. Opium was administered as soon as the disease was encountered, the patient immobilized as far as practicable, urination and defæcation being accomplished with the greatest care and freedom from motion.

Laxatives.—"The voluminous secretion produced by laxative and the increased peristalsis are apt to favor the escape of fæcal matter into the peritoneal cavity, or to precipitate rupture when that has not occurred. After operation, when the temperature rose, there was nothing which acted so well as a saline." (Abbe, Discussion before New York State Medical Society.)

NON-SURGICAL TREATMENT OF DISEASES OF THE RIGHT ILIAC FOSSA.

J. A. HOBSON, M. D., FLUSHING.

In presenting this report of my cases of inflammation of the right iliac fossa, treated from a non-surgical standpoint, I do not wish to be understood as a skeptic in relation to the proper surgical treatment of these cases. On the contrary, I fully concur in the opinions expressed and so boldly and successfully carried out by many of our very best surgeons; that is, that a certain per cent of these cases in the hands of competent men are safer if subjected to timely and proper operation; and I can endorse, with emphasis, the earnest words of one of our greatest American surgeons, Dr. Charles McBurney, when he says, "I do not hesitate to say that never, in the history of surgery, has a major operation so soon established itself in so strong a position, so well supported by sound knowledge and unimpeachable facts, as the timely operation for appendicitis." And further, in this connection, we must not forget that the profession is to-day indebted, in a very large measure, to the skilled hands and courageous hearts of our progressive surgeons for the accurate knowledge of the pathology and clinical history of these cases which we now possess, and which now enables us to complete an early diagnosis, and enter at once upon a judicious plan of treatment.

And yet, when all the brilliant results of surgical interference have been recorded, the calm second thought of the profession at large will settle the questions for the future as to the merits or demerits of any plan of treatment, be it medicinal or surgical. The importance of

coming to a just conclusion, without prejudice for or against any of the means suggested, can not be overestimated, and I hope and believe that in the near future the profession will stand substantially united upon this subject, although I fear much valuable time has been lost, and many lives sacrificed by the indecision and uncertainty engendered by conflicting opinions, and by unprofessional and unmanly charges of over-zeal to operate, on the one hand, and of too great conservatism on the other. Let us act like men, and try to conserve the best interests of our patients by so carefully studying and critically analyzing each individual case upon the basis of facts, and in the improved light of our pathology, I believe every intelligent and thoughtful member of our profession can arrive at as accurate conclusions, and can carry out the therapeutic measures indicated, as successfully as we can in any other of the multiform diseases we are daily called upon to treat.

The cases which I have collected for the subject of this report are twenty in number, and have been seen and treated by myself, or seen in consultation with my medical friends. Of this number, three have been fatal and seventeen have recovered. The three fatal cases were all seen in consultation late in the history of their illness. I will not occupy the time of this Society by a detailed report of all the cases, but will refer to a few which are of especial interest.

CASE 3.—A fatal case; was seen the day before her death from septic peritonitis, which was hastened, I believe, by the administration by the family, with the consent of her attending physician, of repeated large doses of podophyllin, with the idea that constipation was the cause of her trouble.

CASE 6.—Was seen in consultation with Dr. A. H. Hewetson, St. Clairsville, O., with a view to operation, but as the violence of the attack, which was extreme, had, in a measure, subsided, it was thought best to delay interference for the present. The man made an excellent recovery,

and has followed his occupation of shoeing horses to the present time, a period of two years, without a recurrence.

CASE 11. Was first seen by me on the seventeenth day of his illness, this being the third attack from which he had suffered. A very large collection of pus could be made out in the right side, the tumor reaching above the level of the umbilicus, but on a line parallel with the ascending colon. Operation was done on the eighteenth day of the illness. The incision was made over the site of tumor. After opening the peritoneal cavity freely, a large abscess was found surrounding the caput colli. No adhesions had occurred between the wall of the abscess and the anterior abdominal wall. Incision of the abscess was made in a line with the external incision, and a large amount of pus evacuated, which contained fecal concretions, but no appendix could be found. The exceedingly friable walls of the sack were sewed into the abdominal wound, after flushing the abdominal cavity, which had become contaminated, with a large quantity of sterilized water. The abscess was doubtless produced by disease of the appendix. The temperature dropped down to nearly normal, and the patient gave promise of recovery, but died of septic peritonitis on the fourth day. This case was profoundly septicemic at the time of operation, and, I believe, had the surgical interference been timely, his life could have been saved.

CASE 12.—A blacksmith, has had three attacks, the last one two years ago; very severe, and attended with all the usual symptoms; made a good recovery under the usual medical treatment, and still follows his occupation, without recurrence.

CASE 13.—Was seen in consultation with Dr. McPeck, of Bowerstown, Ohio. She had been ill for many months with pain and soreness in the region of the cecum, obstinate constipation and typanitic distension of the bowels. The stomach was irritable, and she could not retain her food. A very large collection of pus was detected in the right iliac fossa, which encroached upon the abdominal

cavity as high almost as the umbilicus. Preparations were made as rapidly as possible for an operation, but before it could be done, the abscess burst into the peritoneal cavity, and the patient died. As far as could be learned from a hasty autopsy, the abscess cavity had surrounded the head of the cecum, and contained a large number of seeds, cherry stones, and small fecal concretions.

CASE 20.—Has had at least four attacks, during two of which he has been under my observation. The last attack was a very severe one, confining him to his bed for several weeks. He was treated in the ordinary way, and has made a partial recovery, but there is remaining, since his last attack, a well-marked tumor at the site of the appendix. Operation has been advised, but declined by the patient, unless it becomes an urgent necessity.

In all the twenty cases reported, the attacks have been so well marked that no serious question could be entertained as to the nature of the trouble. Acceleration of pulse and rise of temperature has been present in all. Pain, tenderness, and swelling over the situation of the appendix have been constant symptoms. The swelling in several of the milder cases, and in all of the more severe ones, has been general to the abdomen, with marked tympanites; vomiting and constipation is the rule, with few exceptions; in none have abscesses formed and discharged, to my knowledge, except those mentioned. In reading the reports of hospital cases, and comparing them with cases observed by myself and others in country communities, I have been surprised to observe the comparatively large number of cases occurring in our larger cities, which go on to suppuration or sloughing of the appendix. I think my medical friends in our part of the State will bear me out in the opinion that suppuration is the exception and not the rule with these patients. From this circumstance I have been led to believe that the usually bad constitutional condition of persons likely to become hospital patients may have much to do with the course of this disease, and if such is

the case, a therapeutic measure to which we could safely confide our patient in healthy country localities might prove very inefficient, or even injudicious, when applied to the treatment of the average hospital case. The plan of treatment to which I have more frequently resorted is something like this: If called early in a case of moderate severity, I give small doses of Hg. Chl. Mitis, followed in a few hours by a saline sufficient to move the bowels freely. I then quiet all pain by small and frequently-repeated doses of powdered opium. If not called until the pain and swelling of the bowels have reached their full development, which is often the case in the country, I consider the administration of cathartics hazardous, and content myself with the opium in small doses, given sufficiently often to relieve all pain and secure the patient rest. I have never found it necessary to give antipyretics, as some advise, but rely solely upon the opium, in connection with local measures, such as the ice-bag, or, in the absence of that, hot fomentations, in the shape of linseed poultices, etc. Enemata of very warm water, thrown well up into the colon, I have found of great value, and have resorted to them very often, with marked benefit. I always insist that the patient shall have absolute rest in bed, not only during the attack, but for many days, and sometimes weeks, after the acute symptoms have subsided, in order that the adhesions may become firm enough to sufficiently protect the abdominal cavity from invasion by any diseased products that may have resulted from the inflammation. Care is always taken to secure for my patients the best possible nutriment by the stomach, if possible, and if not, by the administration of nutrient enemata. I am well aware that this plan of treatment is nothing new under the sun, and that it has been sneered at, and charged with being the cause of dire calamities too numerous to mention, chief among which is the masking of important symptoms—important because pointing to the necessity for a surgical operation, which is often necessary to save the patient's

life. But, gentlemen, is not this a delusive idea? Who among you has seen a septic peritonitis, be its cause a sloughing appendix, a ruptured pyosalpynx, or an unclean abdominal section, that can not be easily recognized by an experienced and careful physician, through the mask of an opium narcosis, though it be given to the full extent advised by the most devoted advocates of its heroic use?

All I have to say in conclusion is, that I have followed the literature of the subject for years; I have noted the gradual rise of the different operations for appendicitis, and its able advocacy by men whose motives and works I respect and honor, and whose skill and care is worthy of all praise; I have also carefully observed my own limited number of cases, and I have formed the opinion that the operation is necessary in only a small number of cases, and that in a far greater number, the treatment known as the conservative or expectant plan, can be successfully carried out. During the past twenty years I have seen and treated many cases of what used to be called typhilitis, peri-typhilitis, etc., not enumerated with the above. I am not without experience in abdominal surgery, and have held myself in readiness at all times to operate, but judging the indications for operation upon the same basis as in other surgical diseases, I have seldom found the indications for surgical interference present.

DISCUSSION.

DR. C. S. HAMILTON.

It is my opinion that a large proportion of cases of appendicitis require surgical rather than medical treatment. This applies to those forms that are graver in their manifestations than catarrhal appendicitis. The latter variety will, under proper medical care, often recover promptly, and sometimes permanently. In a recent article by Treves, the statement is made that ninty-five per cent of the inflammations in the right inguinal region take their origin in the appendix. In the remaining five per cent we may

meet with an ulcer (stercoral or rarely tubercular) in the cæcum, due to the irritating effect of retained feces, or some similar cause. In addition, there must certainly be cases in which a cellulitis arises in the cæcal region, the cæcum and appendix both being healthy, precisely as a cellulitis may arise in any other region of the body, from infection with the germs that cause suppuration. It need hardly be said that cellulitis of this kind would very likely give rise to extra-peritoneal suppuration; nevertheless, I think that it might be difficult to differentiate such a case from appendicitis proper, under some circumstances. Probably it will not be in our power very frequently to make a diagnosis of stercoral ulcer of the cæcum, but the detection of a retained fecal mass there, with other symptoms, might lend a degree of support to that idea.

As for cases of mild appendicitis, it is my custom to use a limited diet of liquids from the start; a diet of such character that it may not develop distention of the bowels. Second, I apply some counter-irritant pretty freely about the affected region, and follow it up with hot applications. At the same time the lower bowel should be emptied by injections. Third, when localized peritonitis is present, with some constipation and tympanitic distention, I have found that the cautious use of salts or calomel may be followed by a very speedy subsidence of symptoms. Probably the laxative relieves not the appendicitis, but the peritonitis accompanying it; and the appendix, though temporarily quiet, may be just as ready to cause trouble in the future as it has been in the past. I shall be much surprised if some one does not protest against the use of salts under such circumstances, urging against it the danger of rupture of adhesions from vigorous peristaltic action. I wish it to be understood that the treatment is *not* recommended when pus is present in quantity, or when the appendix is ruptured or gangrenous, for it would then be useless and injurious.

Again, it is advised when the patient is near at hand, and the abdomen can be opened at any time. And after all, that is the proper attitude to maintain toward any case of appendicitis, no matter how mild the symptoms may have been in the beginning. Whatever may be the objection to the use of a laxative, I have seen the most surprising relief follow this line of treatment in proper cases. In perforative, gangrenous or suppurative appendicitis, medical treatment should, in my opinion, give way immediately to the

use of the knife. The professional mind is quite decided in its stand against the routine use of opium in these conditions, and very rightly. That it is sometimes useful no one can deny. Its indiscriminate use is to be strongly condemned.

Those patients who are subject to attacks of recurrent appendicitis find that privation, exposure, errors of diet and constipation may bring on attacks. They are, of course, many of them, cases suitable for surgical attack. Still, if operation is declined, something may be done in the way of palliation by purely medical treatment. Scrupulous care as to nature of food and condition of bowels, and avoidance of over-exertion, may postpone the next attack for a long time, if not preventing it altogether.

In conclusion, I wish to allude to a case of appendicitis operated upon during the past year. I found a cavity containing pus and fecal matter in abundance. Lying loose in the cavity was a fecal concretion. The appendix could not be distinguished from surrounding structures. Communicating with the cavity was an opening in the cæcum large enough to admit the thumb readily, and through it fecal matter issued in a stream for several minutes. The intestinal walls were so friable that no suture could hold, therefore, none were inserted; and the patient was left with the expectation of another surgical procedure, to close the fistula. However, his physician kept him in bed on a fluid diet for several weeks, and the opening slowly but surely healed, thereby accomplishing what might have been a difficult task surgically. The history of this case is of interest as showing how great nature's reparative powers are when assisted by the intelligence of the physician.

CATARRHAL CONDITIONS OF THE LUNGS PREDISPOSING TO TUBERCULOSIS.

H. S. STRAIGHT, M. D., CLEVELAND.

Flint says that chronic tuberculosis of the lungs is preceded by a long period of depressed health. A condition closely resembling this period is the subject to be discussed in this paper. A shorter name is, The Pretubercular Stage of Tuberculosis, but this term implies too much, because the great majority of cases recover within a few weeks or months. Another definition might be, Localized Capillary Bronchitis. The objection to this term is that the earliest lesions may not be in the capillary tubes at all, but in the pleura. In the well-marked cases there is a more extensive involvement of tissue than the bronchial mucous membrane. Apex catarrh, or apex infiltration, seems to be the best term, and yet these catarrhal conditions occur very often in the mammary regions. If a patient has an apex infiltration it is a condition of importance, and yet patients, and physicians, also, too often infer that the condition is something serious, because it is admitted that there is anything at all the matter with the lung. This is not my idea of these conditions. They recover, in the great majority of cases.

ETIOLOGY.—As to the etiology of these cases, I have little to say. Every one is familiar with the causes of tuberculosis of the lung, as stated in the books. These factors apply to the cases under consideration. Cases of apex infiltration have been legion since the first appearance of la grippe, and yet my dispensary service presented many

such cases the year before la grippe appeared, and now, while la grippe has almost passed away, a very large number of cases still pass under observation. Apex infiltration does not arise as a result of an acute cold. A cold that has settled upon the chest, or a neglected cold, is simply a loose term that one makes use of in talking to patients. The patient and his friends many times date the beginning of his illness from an acute cold, and yet, the acute cold simply drew attention to the patient's condition. Upon careful questioning we can generally find that before the cold was taken the patient had felt tired out, had had a slight disturbance of digestion, or more headache than usual. Exceptionally, no history of indigestion or depression can be obtained. There are two classes of cases of apex infiltration. The cases in the first class are tuberculosis from the beginning, and the catarrhal conditions found upon the examination of the chest are the result of the irritation of tubercular deposits. The course of this kind of cases is ordinarily a bad one. The majority live but a few months. The cases in the second class are simply catarrhal in the beginning,. The most of them always remain a simple catarrh during the whole course of the disease. This catarrhal condition predisposes the patient to tuberculosis by reducing the resistance of the various pulmonary structures to the growth and development of the tubercle bacillus. Why the tubercle bacillus only gains a foothold in a small proportion of these cases is a question no man has answered. The explanation may be faulty, but the course of the disease seems to me to admit of no better explanation. There is no sputum to be obtained in the early cases, consequently, I have made no extended observations. When elastic fibres and tubercle bacilli are found in the sputum the case is one of tuberculosis, and transcends the limits of this paper. I know of no way of deciding whether a given case belongs to the first or second class. This can only be decided by prolonged observation.

SYMPTOMS.—The subjective symptoms are much more severe than any of the patient's friends can understand. This class of patients suffer severely and receive little sympathy. Even the medical attendant may fail to see in the case anything to account for the patient's sufferings. The patient complains of being tired, especially mornings. This morning depression is a marked symptom. After 10 A. M. the patient feels a little brighter, and always later at night than in the morning. This depression is more marked upon one day than another. Patients always feel worse upon damp, cold, rainy days. They tire easily, are nervous, and irritable. They feel dull and sleepy. Headache is a frequent symptom. Many persistent headaches that came under my observation in a general practice of five years were associated with an apex infiltration. This is of great importance. A chest examination should always be made when such cases present themselves. Sharp, cutting pains through the head or through the region of the heart are of frequent occurrence. Also, pain in the lumbar regions, or under one shoulder blade, or between the scapulæ; pain in the lower axillary region; sometimes over the sternum; intercostal neuralgia is very often a symptom of apex infiltration. When a patient complains of sharp, cutting pain in any portion of the chest, or of dull, persistent localized chest pain, the possibility of apex infiltration as a part of the disease, or as a causative factor ought not to be overlooked. An aching all over the body, muscular pain or soreness is a marked symptom; also, a slight dyspnœa upon climbing stairs, or extra exertion, and often of oppression in the upper anterior part of the chest. Patients often complain of pain and discomfort in the throat, and a constant desire to swallow. The larynx often shows nothing in such a case. Pain in some portion of the pharynx is a frequent symptom. Whenever a patient complains a good deal of his throat, pharynx or larynx, the chest ought to be examined. Inflammation of the middle ear is often only a part

of a catarrhal condition of the upper air passages, and more than three-fourths of all the ear cases that have passed under my observation for the last two years were also cases with slight areas of infiltration in some portion of the lungs. Palpitation of the heart and peculiar sensations in the stomach are also marked symptoms. These neuroses of the gastro-intestinal tract are just as liable to occur upon an empty stomach as at any other time.

The objective symptoms may be very few. Usually one can find something in the patient's appearance to make him suspicious of the chest. A slight pallor, a slight disturbance of the gastro-intestinal tract, a sallowness of the complexion, often a trace of albumen in the urine, slight loss of flesh, a peculiar odor of the breath, something characteristic and something that does not occur in connection with primary gastro-intestinal disease. I will not say that tuberculosis of the lungs may not arise in cases of long-continued gastro-intestinal catarrh, but my belief is that the great majority of cases of dyspepsia, that resist treatment for months, are not cases of simple catarrh of the stomach and intestines, but that they are only a localized expression of a general constitutional condition, and that a co-existing apex infiltration is often overlooked. I do not believe that the degenerative process at the apex occurred in consequence of malassimilation, but that the patient had a rapid pulse, a slight temperature and slight evidences of disease at the apex, that were present even before any marked gastro-intestinal disturbance occurred. The pulse is usually slightly accelerated; often ninty-six. It may be of normal or subnormal rate. It is usually irritable and of low tension. It may be irregular or intermittent. The respirations are normal, unless the patient has more fever than ordinary.

The temperature is usually slightly elevated in the afternoon and evening. It may be subnormal in the morning, or even at night.

The temperature is elevated before the pulse is at all affected, and a temperature of 100° with a normal pulse is

common. In the well-marked cases the pulse may be 120. A persistent evening temperature of 99° should arouse suspicion, and when the temperature is continuously elevated at all above 99° the condition is febrile.

The chest examination may reveal, on inspection, nothing at all; a slight flattening in the subclavicular or mammary regions; a congestion of the superficial veins, always most marked over the site of greatest infiltration; or a peculiar pallor of the skin.

On percussion, an irritability of the muscles, myoidema, a slight tenderness upon percussion, increased resistance at some point. Elevation of pitch in the well-marked cases; in the early cases no change in pitch.

Upon palpation, usually nothing; upon auscultation, in a large proportion of cases, only transferance of heart sound. Also very often rough breathing, cog-wheeled breathing, shortened inspiration, subcrepitant râles.

The course and duration of the disease vary within wide limits. The great majority recover within two or three months. Many cases recover upon no treatment at all, while others persist for years in spite of treatment.

The disease is most often mistaken for malaria, chlorosis, primary gastro-intestinal catarrh, a bilious attack, nervous prostration, or muscular rheumatism.

Cases of apex infiltration occur in connection with emphysema, typhoid fever, syphilis, organic heart disease, asthma, chronic inflammation of the joints, and Bright's disease. An apex infiltration is often overlooked in connection with disease of the lymphatic glands, pre- and post-cervical, submaxillary, and even inguinal.

The treatment consists in the administration of beech-wood creosote, or guaiacol, or benzosol, and tonics.

SUPRA-PUBIC CYSTOTOMY IN A CASE OF TUBERCULAR CYSTITIS.

By C. E. Perkins, M. D., Sandusky.

The case which forms the subject of this report came under my care August 29, 1892. Frank E., æt. 17 years. Father died of pulmonary tuberculosis when the patient was three years old. Otherwise family history negative. He had suffered more or less from childhood with disorder of genito-urinary system, mostly incontinence of urine, I should judge from what his mother says.

In the Fall of 1891 he fell and struck on his testicles. This was followed by pain and swelling in both organs, the latter persisting. In December of same year, he contracted what his mother calls "the grip." From this he did not recover, but progressively lost flesh and strength, passed urine with pain and more frequently than normal, becoming so bad that during July and August urination, accompanied by severe tenesmus, occurred every five or ten minutes. He lay on the floor on his side, with a cup constantly in position to catch the urine. The pain and tenesmus rendered his nights nearly sleepless. I found emaciation extreme, indigestion of food, with diarrhea. Physical examination of heart and lungs negative. Afternoon temperature between 99° and 100°. Both epididymes seat of hard lumps, the size of marbles; not tender or adherent to the skin. He was passing about a pint of urine in the twenty-four hours. It contained mucus, pus cells, blood cells and epithelium, also urates quite abundantly. I was unable to introduce the catheter, on account of severe pain in prostatic urethra, where some obstruction seemed to be present.

I tried medicinal treatment for ten days without satisfactory effect. Then, under ether, the bladder was entered and irrigated with boric acid solution. The eye of catheter brought away a piece of tissue, which, upon microscopic examination, proved to be of a tubercular nature. After this, on alternate days, the bladder was washed out, and mixture of iodoform, glycerine and water injected. He improved for two weeks, then began to get weaker, and the vesical symptoms returned as bad as before. His condition became very serious, and death appeared likely to take place at any time. I called Dr. Charles Graefe in consultation, who, I may add, had seen the case with me several times before. We considered it our duty to give the boy the only chance for life we could see, and determined upon a supra-pubic opening of the bladder, which was done upon the following morning, September 28th. Dr. Klein, of Sandusky, O., administered ether. I did not use the rectal bag, but injected six ounces of boric acid solution into the bladder, that being its predetermined capacity. Usual antiseptic measures were employed. I made the incision four inches long, in the median line, extending inferiorly to the pubic symphysis. Bleeding points caught with forceps as they appeared. Peritoneum was exposed (unavoidably on account of smallness of the bladder), and pushed up. Into the bladder, thus exposed, two silk sutures were inserted, and an incision, about one and three-quarter inches long, made between them. The mucous membrane over the entire bladder was found to be degenerated into a sort of granulation tissue. This was removed with curette and finger nail, about an ounce in all. Hemorrhage was quite free. The upper part of abdominal incision was closed with deep silk sutures, the edges of the cystic opening sutured to the skin, and the bladder packed with strips of iodoformized gauze. Bichloride gauze and large pad of cotton, held in place by binder, completed the dressing.

He reacted well from ether, and seemed to improve from the very start. Never developed marked temperature, and

was out of bed in a week. The subsequent treatment was by tonics, and on alternate days irrigation of bladder and injection of iodoform and glycerine. He could not wear a tube in the bladder, as it caused him pain. The urine was caught in absorbent cotton and towels; the skin being well covered with vaseline, excoriation was successfully prevented. At the end of the month the wound had contracted to a small fistula, and nearly all the urine was passed "per vias naturales." I did not allow the fistula to heal, as I was anxious to use it for irrigation and treatment of the bladder, and also to permit drainage during sleep. He gained in flesh and strength for three months, then he began to be worse. Complete extension of left thigh became impossible, and while walking or standing his body inclined markedly to the left. There was pain on pressure over nearly the whole of left side of abdomen. Urine contained pus in large amounts, and diminished to ten ounces in twenty-four hours. I considered the advisability of left nephrectomy, but from the great probability that the right kidney was involved, I considered it contra-indicated.

He died at his home in Vermillion, Ohio, four and a half months after the operation. I performed the autopsy fourteen hours after death, in presence of Dr. Charles Graefe, of Sandusky, and Dr. Quigley, of Vermillion. Extreme emaciation. Lungs, heart, stomach, and intestines normal; liver amylaceous; the bladder capacity was about ten ounces; fistula still patent, otherwise bladder was free from disease. Right kidney, cortex non-adherent; on section there was absence of markings in one-third of kidney where the tissue was softer than normal. Left kidney had degenerated into a sac of pus. Perinephritic abscess occupied the whole left psoas-iliacus muscle. The muscle tissue was absent, and its place occupied by dark, foul-smelling "debris."

The first supra-pubic cystotomy for tubercular cystitis was done by Guyon, in 1885, although Iverson had, a few

months before, found this disease in a bladder opened by him for the treatment of ulcer. Subsequently the operation has been performed and advocated by Riverdin, Guyon, Pilcher, Bangs, and others.

While from one case it would be unwise to generalize, still, from its study, and those reported by others, I feel justified in concluding that in supra-pubic cystotomy, removal of diseased tissue, so far as possible, and subsequent treatment with iodoform, locally applied, we may effect a cure in a not insignificant number of cases of tubercular cystitis, and ameliorate the condition and prolong life in nearly all the rest. The usual course of the disease is well shown in this case. Beginning in the epididymes or vesiculæ seminales, possibly from traumatism, thence invading the bladder and kidneys, and causing death by destroying their secreting power. Hence, the importance of early operation, for by this means we may hope to arrest the tubercular process before invasion of the kidneys takes place.

PARAESTHESIA OF THE PHARYNX AND LARYNX AS A PREMONITORY SYMPTOM OF TUBERCULOSIS OF THE LUNGS.

By Julius Wolfenstein, M. D., Cleveland.

Paræsthesia of the pharynx and larynx is an affection often met with by the laryngologist, and the etiology which suggests itself to his mind is, primarily, hysteria and hypochondria, and, secondarily, the results of injury to the mucous membrane by swallowing some hard substance. That these are the etiological factors in a large percentage of the cases of paræsthesia of the pharynx and larynx is established beyond doubt; in fact, most of the modern text-books mention no other cause. To mention but a few instances: Bosworth, in his late work on the "Diseases of the Nose and Throat," has a very unsatisfactory, brief article on this affection, and he believes that most cases of paræsthesia can be traced to some local pathological condition. This same view is also most strongly upheld by Lennox-Browne, in his well-known text-book. It is true, Bosworth does mention that the affection occurs in anæmia and phthisis, and in individuals of nervous temperament, but in such a cursory manner that the reader perceives that he lays very little stress on the subject. As another example, take Schötter's "Vorlesungen über die Krankheiten des Kehlkopfes," etc., published within a year. He states that most cases of paræsthesia of the larynx are due to injuries produced by swallowing some hard substance; hypochondria and hysteria come next, and anæmia is casually mentioned among the causes. Without quoting any more authorities, except to say that Mackenzie, with his

wide experience, merely mentions a nervous and traumatic etiology, which would simply be a reiteration of what has been said before, allow me to call attention to but one more text-book on this subject: Gottstein, in his "Krankheiten des Kehlkopfes," which, by the way, is certainly the most excellent treatise on these diseases extant in any language to-day, calls attention to the fact that paræsthesia of the larynx is one of the frequent symptoms of the early stages of tuberculosis of the lungs. The first one who called attention to this fact was, I believe, Jurasy, in his monograph on the subject of "Sensory Neuroses of the Pharynx and Larynx." This was published as early as 1881, but it seems that the subject has not received the attention its importance demands.

In his monograph, Jurasy remarks that these cases of paræsthesia are "relatively not rare" complications of beginning tuberculosis of the lungs. As mentioned before, Gottstein's observations coincide with those of Jurasy, and as far as my personal experience goes, which, I must confess, is not very extensive, for I am yet a tyro in my specialty, I have seen at least a half dozen cases in the past three years, of paræsthesia of the pharynx and larynx, whose etiology could be traced to no other source than probable beginning tuberculosis of the lungs. The history of several of the cases afterward positively proved the correctness of my supposition.

As regards the symptomatology of this affection, I can be brief. Paræsthesia in this region of the body manifests the same indefinite and varied subjective sensations which characterize this peculiar symptom as an accompaniment of so many nervous affections, like tabes dorsalis, cerebrospinal sclerosis, etc. The patients complain of pain, which they now locate in the region of the larynx, now in the tonsil, now in the tongue, now on one side, now on the other. The pain is never constantly present in any definite locality. Again, some patients complain of the most peculiar and unheard-of sensations, of tickling, scratching,

burning, pricking, numbness, dryness, etc., etc. Schrötter mentions the case of a patient who said he had the sensation as though "a mouse ran through his throat." As is universally the case in sensory neuroses, the perverse sensations complained of are peculiar and preposterous in direct proportion to the morbid imagination of the patient. The only definite thing in the history of this class of cases is the indefinite character of the symptoms, *i. e.*, the uncertainty on the part of the patients of localizing and describing the perverse sensations, and the oftentimes changing character of these sensations.

Besides these sensory neurotic symptoms, there are also present at times paroxysms of cough in the vain attempt to remove the irritation felt by the patients, and we find even occasionally in these cases motor neurotic symptoms, like contractions of the laryngeal and pharyngeal muscles, which are very disagreeable to the patients.

Coming to the most important part of my paper, the differential diagnosis between the various kinds of paræsthesia of the pharynx and larynx from the etiological standpoint, I shall try to be brief and give you succinctly the most important symptoms which characterize this affection, as an accompanying, and particularly as a premonitory, symptom of pulmonary tuberculosis.

In every case of paræsthesia of the pharynx and larynx, a most careful local examination must be made, to exclude any local pathological condition as a cause for the paræsthesia. It is hardly necessary to add that, particularly in nervous individuals, a naso-pharyngeal catarrh, a chronic pharyngitis or laryngitis, or even the tiniest of those almost universally-present granulations on the rear wall of the pharynx, or hypertrophy of the lingual tonsil, may produce paræsthesia. So, firstly, all local causes must be excluded.

The hysterical cases are generally easily excluded, for there is usually present in almost all these cases the well-known globus hystericus.

The hypochondriac cases are more difficult of exclusion, but they are generally found in otherwise healthy-appearing individuals, who use their voices professionally, *e. g.*, teachers, singers and clergymen. Another class of these hypochondriac patients are the syphilaphobes, who constantly imagine that syphilis is manifesting itself in their throat. I have a striking example of this kind. A patient who visits me regularly several times yearly, complaining of the most peculiar train of symptoms, tickling, pricking, drawing, etc. Still I have never been able to find anything abnormal. The man is perfectly healthy, but had a chancre several years ago. He is fearful that syphilis will "break-out" in his throat, and he comes to me several times a year for consolation.

As regards the class of cases due to injury to the mucous membrane, produced by swallowing some hard substance, where the patients have the sensation of a foreign body in various locations of the throat, the history of the cases will generally give us a clue as the character of the paræsthesia. The patient is generally able to state definitely when the peculiar symptoms were first noticed, and their beginning can then generally be traced to an injury produced by swallowing some substance, which, by its irregularity or hardness, wounded the mucous membrane of the throat. This wound or injury, which may be so slight that it can not be discovered even with the most careful examination, may cause the patient the sensation of the presence of a foreign body in the throat. These painful or disagreeable sensations can, as a rule, be perfectly localized by the patients, and their locality does not vary. A most careful examination of the entire throat must be made, so as to be positive that there really is no foreign body present; and after this is done, appropriate measures should be used to remove as speedily as possible the inflammation and irritation following the injury. These cases are generally of short duration; their beginning can be definitely traced, and they are generally easily diagnosed as due to a lesion of the mucous membrane of the pharynx or larynx.

But there are cases of so-called imaginary foreign bodies in the throat, where the peculiar sensations complained of by the patients can not be traced to any injury of the mucosa, or to the presence of a foreign body. These cases generally occur in anæmic individuals, particularly women. They are very refractive to treatment, and are anything but satisfactory cases to the practitioner. I am inclined to believe that the majority of these cases may perhaps be included under that category of paræsthesia of the throat, which is premonitory of tuberculosis of the lungs.

In treating of the class of cases of paræsthesia of the throat, which are accompanying or premonitory manifestations of tuberculosis of the lungs, allow me to give you, in brief, the history of only two cases of this nature. I believe this will best give you the points in the differential diagnosis that I wish to make. In the first case the paræsthesia was an accompanying symptom, in the second case it was a premonitory manifestation of pulmonary tuberculosis.

CASE I.—About three years ago, a man, twenty-five years of age, was sent to me for treatment. For the past few months he noticed the following symptoms: a peculiar, indefinite sensation of pain and burning in the various regions of the throat, now in the palate, now far back in the pharynx, now on one side of the larynx, now on the other. He could not state definitely either the cause or the time of the beginning of these symptoms. He also coughs occasionally. There is history of tuberculosis in the family. A careful examination of the nose, naso-pharynx, pharynx, and larynx revealed nothing abnormal outside of a slight redness of the true vocal cords, but as he used his voice considerably this was not surprising. An examination of the lungs revealed a moderate degree of apex catarrh on both sides. There was also slight elevation of temperature, 99½° F., and some acceleration of the pulse, 84. In view of the family history, the physical signs in the lungs, the elevation of temperature, and acceleration

of the pulse, a diagnosis of beginning tuberculosis of the lungs was made. The patient was given creosote in increasing doses, was ordered to take plenty of nourishing food, and was given the well-known instructions ordered to patients with beginning tuberculosis of the lungs. No treatment was ordered for the throat. In four weeks the paræsthesia disappeared, and with some slight recurrences has not returned for two years. The patient is now practically well.

CASE II. — A woman, aged about twenty-six, came to me about four months ago. She was sent to me for an examination of her throat. She complained of pain in the throat for about three months past, with some cough, and, occasionally, spasmodic contractions of the muscles of the larynx and neck, so that she sometimes had difficulty of breathing. This was, however, only momentary. The pain and "drawing," as she termed it, were not constant, nor were they always on the same side. Sometimes these symptoms disappeared for a week at a time, when the cough also disappeared with the pain and contractions. The physician who had sent her to me had made an examination of the lungs, but had found nothing abnormal. I, also, found no abnormality in them. The throat was absolutely normal—there was not even anæmia of the structures present. After much questioning, the patient remembered that some distant relative of hers had died of tuberculosis. To do something, I gave the patient creosote in moderate doses, four grains per day. So as not to prejudice her mind, I told her that her throat affection was a nervous trouble, and would probably last a long while. Two weeks later the patient informed me, without any interrogation on my part, that the paræsthesia was considerably improved. I increased the dose of creosote to six grains daily, and four weeks later the patient informed me that, while the paræsthesia was still occasionally present, it was much improved. The patient has gained in weight, looks better, and has a better appetite.

In brief, then, the cases of paræsthesia of the throat, which are premonitory of tuberculosis of the lungs, are characterized, principally, by uncertainty on the part of the patients as to cause and time of beginning of their symptoms. Then, in cases of anæmia of the throat in combination with the paræsthetic symptoms, this condition should be thought of; although, as I shall mention later, anæmia of the tissues of the throat is not an absolutely necessary condition in this class of cases. This condition should also be suspected in all cases where the patient has the well-known habitus phthisicus, or where tubercular family history is present; and, finally, in all cases which can not be definitely traced to an injury of the mucosa, or which are not positive types of the hysterical or hypochondriac varies.

As regards the pathology of this affection, we must, honestly, say "ignoramus." We do not know the reason why, in the beginning stages of tuberculosis of the lungs, there should be these peculiar nervous manifestations in the throat. Jurasy has attempted an explanation, and calls these paræsthetic manifestations "reflex empfindungen" (reflex sensations). He explains their causation by transference of the irritation of the pulmonary changes on the sensory fibers of the pharyngeal and laryngeal nerves. He says that this theory is rendered plausible by the fact that these fibers are branches of the same nerve, the pneumogastric, which, it is well-known, distributes sensory fibers both to the lungs and the pharynx and larynx, and also motor branches to the muscles of the latter. This attempted explanation is still an unsubstantiated theory, and while very probable, we must confess that we do not to-day know the true reason for the presence of paræsthesia of the throat in the early stages of tuberculosis of the lungs. Gottstein lays stress upon his observations that all these cases occur in anæmic conditions of the pharynx and larynx, and, hence, he perhaps considers the paræsthesia as a trophoneurosis. This certainly does not hold good in

all cases, for Jurasy declares that there are cases of paræsthesia of this kind where there is absolutely no anæmia, and that it occurs in the very earliest stages of tuberculosis of the lungs, where positively no abnormality can be detected in them by the most careful examination—which, later, by their history, proved to be pulmonary tuberculosis—and where there was not yet sufficient for the anæmia of the throat to supervene. I can corroborate this statement, for in the second case, detailed before, there was absolutely no anæmia of the throat and no apparent abnormality of the lungs. Still, I am convinced that this is one of those cases of paræsthesia accompanying the initiatory stage of pulmonary tuberculosis, where the changes in the lung tissues are so slightly developed as to escape our present methods of examination.

In conclusion, I would say a few words as to the prognosis and treatment of this variety of paræsthesia of the throat.

If we feel convinced that the paræsthesia is due to or accompanying the initiatory stage of tuberculosis of the lungs, the prognosis is generally favorable. That is to say, if the pulmonary pathological conditions can still be inhibited, or made to disappear by appropriate treatment, the paræsthesia will disappear in the great majority of the cases in time. Still, there are some cases which will persist in spite of any and all treatment.

As regards the treatment, local measures should be entirely discarded. They are of no avail, and it is simply waste of time and energy to persist in their use.

It would be "like sending owls to Athens," were I to attempt to bring forward any arguments to-day in behalf of the employment of creosote in the treatment of tubercular affections of the lungs, especially in the early stages. It is a well-established fact that, in the early stages of tuberculosis of the lungs and their complications, creosote properly administered is followed by the most beneficial and gratifying results. I have seen most excellent results in quite a number of cases of tuberculosis of the lungs in

their early stage with the creosote administration, and I consider it the remedy par excellence in these cases, both uncomplicated and complicated throat affections.

I consider the paræsthesia of the throat as one of the complications of pulmonary tuberculosis, even in those cases in which no physical changes can be discovered in the lungs by auscultation and percussion, and I would advise the use of creosote, in gradually increasing doses, as the remedy which to-day gives the best results in these cases.

Finally, I am inclined to believe that cases of paræsthesia of the throat, as a premonitory symptom of tuberculosis of the lungs, exist much more frequently than the very limited literature on the subject would lead me to believe.

To recapitulate: Paræsthesia of the pharynx and larynx is not a rare accompaniment of the early stages of tuberculosis of the lungs.

In those cases where no physical signs can be found in the lungs, it should be considered a premonitory symptom of tuberculosis of these organs.

1. If there is tuberculous family history.

2. If the paræsthesia can not be definitely traced to a foreign body, or an injury produced by such an agency, or by the swallowing of some hard substance.

3. In the cases of imaginary foreign body of indefinite ætiology, with the presence of anæmia; and

4. In all those cases which can not be positively placed under the head of hysteria or hypochondria.

Finally, these cases are best treated by the internal administration of creosote without the use of any local treatment.

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LAW IN TUBERCULOSIS.

H. H. SPIERS, M. D., RAVENNA.

In mathematics, whenever a regularity can be traced, the general proposition expressing that regularity is called a law. For many years I have been led to believe that tuberculosis is obeying certain fixed law, as the planets obey law in revolving around a central sun. To the general observer this statement may seem chimerical.

Zone.	Ventilation.	Death Rate.	Ratio.
Frigid	0 . . Perfect. . .	0 . . Zero . .	1
Torrid	5 . . Less perfect	5 . . Small . .	1
Temperate . .	10 . . Least "	10 . . Great . .	1

The ratio between ventilation and death rate is always constant.

Tuberculosis obeying law? Apparently no order in appearance or disappearance. No regularity in mode or extent of visitation. Coming and going like the wind, or a bird of the air—all is chaos, discord, and confusion. So thought the ancients of the worlds about us. But soon law is discovered; order is evolved; a system is formed, and it is found that not only do the planets move, but in regular orbits and with matchless precision. Stand by the seaside and watch the incoming and outgoing tide. Note with accuracy the flood and ebb of waters. Without previous knowledge you could assuredly say these waters move in obedience to law. A law now fairly well understood—the law of gravitation.

Stand by the bedside and observe the death rate from tuberculosis. Note the accuracy the figures tally year by

year: Frigid zone, o; Torrid zone, small; Temperate zone, great. Without previous knowledge you could assuredly say these factors are essentials to the formation of law. On these essentials is based the law of tuberculosis. Extend your observations to the coast-line of a continent. Mark the varied difference in tidal wave in the various latitudes. Truly, you could say this law is not equally potent at all places—but observe it is, nevertheless, the *same law*, and the difference in height of tidal wave is due to the coast-line of the continent. Extend your research to prevalence of tuberculosis in the cities of the world. Mark the varied difference in places of the same latitude. Truly, you could say here is absence of law. But observe the same law prevails, and the difference of prevalence is due to obeyance of atmospheric influence.

I herewith give, from standard authors, the maximum of tide for the places named:

Bay of Fundy,	75 ft.
Boston,	10 ft.
Straits of Magellan,	50 ft.
Florida Reefs,	2 ft.
Head of Persian Gulf,	36 ft.
Mid-ocean, from	2 to 3 ft.

I herewith append, from W. Halle, a partial table showing the prevalence of tuberculosis per ten thousand, 1889 to 1890, for cities named:

Brunn,	76.7
Baltimore,	24.9
St. Petersburg,	48.8
London,	18.4
Vienna,	54.4
Rome,	22.5

As the difference in height of tide along the sea-coast does not invalidate the law of gravitation, neither does the difference in per cent of tuberculosis in the various cities invalidate the law of tuberculosis.

In truth, the law in both cases is verified by the apparent contradiction.

In dealing with the problem of the tides, we find it complex and difficult. Equally complex and difficult is the problem of tuberculosis. If the tide and tuberculosis be alike based on law, they should alike be susceptible of demonstration, and barring preconceived opinions, should alike be worthy of credence.

As already stated, the death rate is modified by obeyance of atmospheric influence. The stabled cow, the penned sheep, the tame rabbit, the caged monkey, lion, tiger or elephant, almost invariably die of tuberculosis. Seldom, or never, do these animals die of this diseases if living in the open air. The disease prevails much more among those whose vocations are sedentary than among those whose occupations are out of doors. The mortality in prisons has been shown to be four times as great as outside. The death rate from phthisis is estimated at fifteen per cent of the total mortality, while in prisons it is from forty to fifty per cent.

Primary tuberculous lesions are, in a majority of cases, connected with the respiratory organs.

"There is nothing essentially destructive or necessarily fatal in tuberculosis. That in all stages it may be checked, and enable the person affected to live many years, and die subsequently of old age or other disorders."

The Rev. Josiah Strong, author of "Our Country," said, in my presence, a number of years ago, words like these: "When a young man, I was declared consumptive. Sentence of death was pronounced by able physicians, east and west. I took no medicine; ate plain food, and lived wholly in the open air. To-day I am the picture of health."

Dr. Joseph Parrish, of Philadelphia, gives a similar experience.

Many present, no doubt, can recall cases that have a like bearing. It is, therefore, seen a constant ratio exists between ventilation and death rate. As the ventilation

becomes poor, the death rate increases, and vice versa. The law then, as laid down in October, 1890, is simplified thus: The ratio between ventilation and death rate is always constant. In order to present this more clearly to the intellect, through the eye, I have arranged the following table:

Zone.	Ventilation.	Death Rate.	Ratio.
Frigid	0 . . Perfect. . .	0 . . Zero. . .	1
Torrid	5 . . Less perfect	5 . . Small . .	1
Temperate . .	10 . . Least "	10 . . Great. . .	1

If, then, a regularity be traced, what shall we say of law? According to the definition, law must exist.

But it has been said that confinement, with insufficient ventilation, means the presence of the bacillus. Observe this: Exposure to atmosphere breathed by consumptives is not attended with danger so long as good ventilation is maintained. Observe this: Ill ventilation, whether in the private room or crowded tenement, invariably increases the death rate. Good ventilation, then, insures immunity. Ill ventilation insures death. Can this much be said of the absence or presence of the bacillus? Is tuberculosis caused by the bacillus? Before the world to-day it stands not proven.

Look upon that field, with its depression in the center. The rains of heaven fall upon that field. The depression is filled with water, and it becomes a shallow lake. Rushes, reeds, and grasses, peculiar to low places, begin to grow in that lake. Did the rushes, reeds, and grasses cause the depression? Did the rushes, reeds, and grasses cause the lake? Drain the lake, the rushes, reeds, and grasses disappear. But, says the objector, can we not take these rushes, reeds, and grasses and make them grow on the arid mountains? Yes, we can; but how great the labor and how small the result.

Yes, we can; *but nature does not work in that way.*

Look upon that man as he walks the streets. A bad family history, a prolonged illness—the depression in that

field. Grinding poverty or pampered luxury has been his lot—the rains of heaven. Bacilli begin to grow in his lungs, are found in his sputum—the rushes, reeds, and grasses. Did bacilli cause that man's history or illness? Did bacilli cause poverty or luxury? Take away the conditions, the bacilli disappear. But, says the objector, can we not inject bacilli, or a pure culture, into the healthy tissue and cause the disease? Yes, we can; but how great the labor and how small the result.

Yes, we can; *but nature does not work in that way.*

Tuberculosis caused by the bacillus? Tuberculosis is transgression of natural law. Violation of law brings its penalty; observation of law its reward. Standing near a spot sacred to every true American, I declare tuberculosis can be controlled. Not by the injection of chemicals—not by the injection of tuberculin, but by the observation of law.

PALPITATION OF THE HEART.

By J. T. Whittaker, M. D., Cincinnati.

Palpitation of the heart, though considered as a separate affection, is a symptom, and not a disease; it is the symptom of many diseases, and is very simple in its manifestation, but very complex in it cause. Mere beating of the heart does not constitute palpitation. The heart beats always. The heart never ceases to beat. Sleeping and waking the heart beats. It takes its rest between pulsations. The heart beats long, short, pause. The pause is the rest. Nor does violent beating of the heart constitute what is known as palpitation. The heart beats violently under effort. Sometimes the heart beats violently and the patient is unconscious of it. Palpitation is a beating of the heart which is felt by the patient. It is such an action of the heart as shakes the wall of the chest so that the patient feels it. That increased action, palpitation, which occurs under effort, running, climbing, etc., is physiological. Palpitation is pathological when it occurs without any effort at all.

It is impossible to understand anything about palpitation without knowledge of the innervation of the heart. The modern anatomical idea of the nerves of the heart is this: The branches of the vagus and sympathetic, which form the heart plexus, each develop after their entrance into the thoracic cavity, a plexus in front of and behind the ascending aorta. ' Both unite to form the plexus coronarii about the coronary arteries. Ganglia are found in the wall of the auricle, especially in its septum, and at the borders of the arteries. The ventricles have no ganglia at all. The motor

fibers originate, according to the studies of His last year, in that part of the central nervous system which becomes later the ganglia of the anterior horns. The sensitive nerve fibers originate from cells in the spinal cord.

The development of the sympathetic cord has been, up to recently, in doubt. Kölliker, as long ago as 1850, showed the resemblance of the spinal and sympathetic ganglia, of the communicating branches and of the posterior roots, intimating that the sympathetic ganglia very probably originated from the spinal ganglia. But it was only recently that Onodi was able to demonstrate that the sympathetic ganglia are, in fact, offsprings of the spinal ganglia. The sympathetic ganglia belong, according to the evidence of development, to the domain of the posterior roots. All the nerve fibers of the posterior roots, all the ganglion cells, all the end organs are, according to general acceptance, sensitive and not motor. So that the ganglia of the sympathetic nervous system belong to the sensitive system. This fact has an important significance on the function of the heart ganglia. Both the vagus and the left recurrent, *i. e.*, the spinal accessory, send, united with sympathetic fibers, branches to the heart. All heart nerves carry at the same time cerebro-spinal and sympathetic fibers, but the heart ganglia belong only to the sympathetic system. These ganglia are only in the auricles, *i. e.*, in the receiving chambers. They feel at once the effect of poison in the blood.

Until a better explanation is found, we must believe that the motor impulse of the circulation originates in the heart muscle itself. The muscle makes rythmical contractions without being excited by nervous elements. The heart muscle is the automatic motor of the circulation. If its power is reduced by pathological change, its capacity diminished, there occurs much more immediate damage to the circulation than from changes in the heart ganglia. Anomalies connected with the heart itself, arising from general diseases, find explanation in accurate study of the

muscle of the heart. The nerve centers do not originate the motion. The nerves merely inhibit and regulate the rhythm. Hence, all the factors may be concerned in palpitation. Gley corroborates previous investigations on the conduct of the heart under electrical irritation. It has been shown by previous studies by Ludwig, Hoffa, Kulian and Einbrodt, that the heart under electrical irritation is put into delirium, and finally stands still. The finest examples of palpitation of the heart are found in Basedow's disease. In this condition palpitation usually prefaces for months or years the exophthalmos and the goiter. There is at the same time general tremor and neurasthenia. So that Basedow's disease is supposed to act upon the heart through the nervous system. But disease of the thyroid gland begets a peculiar train of nervous, vascular and chemical changes; for instance, mucous degenerations, which are not without influence in producing palpitation. These cases of palpitation are benefited temporarily by atropia, which is a tonic to the vagus. A case that I saw with one of my colleagues, Dr. Ransohoff, was most markedly benefited by the injection of thyroid juice from the sheep.

Most cases of palpitation can be reduced to three causes: Direct, reflex and toxic. These causes rarely operate singly or alone. Under the direct causes are irritation at the origin of the nerves, as organic disease of the brain, including the finer lesions of the cortex. Palpitation sometimes occurs as an alternating neurosis, with migraine, or with epilepsy; in fact, palpitation is sometimes the aura of epilepsy. This palpitation is best relieved by atropia and the bromides.

The action of the heart under psychical influence is, up to certain limits, physiological. Beyond these limits, or when the action of the heart is felt by the patient, it is pathological and constitutes palpitation. Thus, the heart is said to beat high, to leap, in conditions of exaltation, joy, anger, expectation; or it flutters with fear, fright,

anxiety. Nervous patients are seized with palpitation under examination. Many individuals may not pass for life insurance until they have remained some time in the consultation room, and the heart's action become quieted. Stage fright often takes the form of palpitation. Public speakers have not infrequently fallen victims to the tumultuous action of the heart, which breaks distant blood vessels in the brain, or leads to over-strain and paralysis of the heart itself.

I am consulted every year by students affected with palpitation in the study of diseases of the heart. Peter Frank had such violent attacks, with intermittent pulse, while he was writing his work on diseases of the heart, that he believed himself to be the subject of aneurism. After he had finished his work, and sought diversion in travel, the attacks disappeared.

Among the direct causes must be considered also diseases of the heart itself, which, whether of its walls or valves, is liable to be attended with palpitation, On the other hand, the most serious diseases of the heart may exist without palpitation. In his studies of diseases of the heart, Fraentzel, in speaking of acute and chronic myocarditis, lays much stress, with Rühle, on arythmia, and emphasizes the fact, also, that especially in young persons even long-continued irregular pulse may be a condition without significance, and that, on the other hand, the rhythm may remain normal even with severe disease of the heart muscle. The author shows also, by a case which came to autopsy, that paroxysmal tachycardia is sometimes a symptom of chronic myocarditis.

Pestreich reports seven cases of fatal heart failure after palpitation as the result of bodily strain.

Romberg describes the condition of the heart muscle, after typhoid fever, scarlet fever, and diphtheria. Parenchymatous and interstitial processes occur in these diseases. These are the cases of palpitation from organic disease. These are the cases that are benefited by the heart tonics, especially strychnia, and, above all, by graduated exercise.

In obesity, the overloaded heart palpitates to do its work. In emaciation, the insufficiently-nourished heart struggles to expel its contents.

The reflex causes are various diseases of other organs, as of the stomach. Dyspepsia, from whatever cause, is often marked by palpitation. The condition may be caused here by direct, *i. e.*, mechanical, pressure of the distended stomach, and by mechanical occlusion of the great vessels. It is more frequently toxic, and results from the absorption of noxious matter through the alimentary canal. Thus, palpitations are found in connection with sick headaches. Diseases of the uterus are frequently connected with palpitation. Proof is the relief of the condition with the cure of the disease. One of my worst cases was cured by exsection of a diseased Fallopian tube. Intense palpitation was caused once in a case, also under the observation of the writer, as the result of irritation of the prostatic urethra. The palpitation awoke the patient at night with a sense of impending death, and a cold sweat. Posterior urethritis has in its train of symptoms headache, neuralgia, hysteria virilis, and, at times, palpitation of the heart. Here, too, the condition is partly, if not chiefly, toxic, in that toxines are absorbed into the blood, and directly, *i. e.*, through the coronary arteries, irritate the heart muscle. With the elimination of these toxines, mostly by diuresis, the palpitation ceases; or the attacks are prevented altogether, *i. e.*, the condition is cured, by deep injections with strong sulutions of the nitrate of silver.

Diseases of the ovaries, attacks of colic, produced by the passage of gall-stones and kidney-stones, induce attacks of palpitation.

Under toxic causes may be included impoverishment of the blood. Palpitations occur in typical outbreaks in cases of anæmia of all forms, including that from hemorrhage or other exhausting discharges. These cases are often expression of mere exhaustion, or insufficient nutrition. They are also due to toxic products which develop in the

blood in these states. So tuberculosis and Bright's disease are prefaced for a long time by attacks of palpitation, and are accompanied by them through their course. The heart, in these conditions, becomes excitable under the slightest effort, or under no apparent effort. Such individuals are said to be sufferers of erethismus cordis. Here, too, there is an insufficient nutrition, as well as a toxic action. Absorption of diseased products from various organs and from the alimentary canal has already been mentioned. The point is that, in so many cases, palpitation depends upon a poisoning of the heart muscle itself, as well as of the nerve centers.

Palpitation occurs in Bright's disease, especially in connection with hypertrophy of the heart, and repeated attacks of palpitation in middle life should excite inquiry for the other neuroses, the headache, hebetude, vertigo, etc., of this affection. Evidence of this condition is revealed, also, by the increase of blood pressure in the arteries. There are physiological periods in which blood pressure is increased and palpitation is common, as during menstruation, and at the grand climacteric. It will soon be common practice to take the blood pressure in every man after the age of thirty in the study of arterio-sclerosis, for man "is as old as his arteries."

Alcohol is one of the most frequent causes of palpitation. Parkes showed that the pulse of a man who drank only whisky for six days numbered 90.9 in the minute, while that of a man who drank only water in the same time beat only 73.6 per minute. Coffee and tea produce the same effect, but in much less degree. Tobacco is a powerful poison to the heart. The first use is wont to produce attacks of palpitation. The habitué experiences palpitation, as well as pain. The pain alone, however, is severe enough to make him quit the use or abuse of tobacco.

Lehr says that students, at the last end of the session, who consume the night in study, sustain themselves with

tobacco, strong tea, and coffee, form twenty per cent of cases of the palpitation of neurasthenia, while forty per cent is composed of merchants and artisans, who have used themselves up in unsuccessful rivalries and struggles.

Thus, palpitation depends upon many and various causes. In many cases the cause is in the heart itself. Tumultuous action is best restrained by the application of ice-bags over the heart. Often it is entirely outside the heart, and is the expression of an irritation of the nervous system. The irritation itself is, in the majority of cases, toxic. Some toxine is absorbed into the blood and poisons the heart muscle, or centers of its nerves. The use of the stomach tube, which prevents the necessity of absorption and subsequent elimination, and salol, which neutralizes toxines in the alimentary canal, cures some of these cases.

Palpitation of the heart is a condition which teaches the physician that he can not practice medicine by routine.

DISCUSSION.

DR. J. W. SCOTT.

I understood the doctor to say that no nerves are connected with the heart muscle itself. I have been taught to think there are ganglia in the heart muscle itself, and when they are excited they carry on a certain amount of independent excitement.

THE HEART IN EXOPHTHALMIC GOITER.

D. W. STEINER, M. D., LIMA.

In the brief time allotted to this paper it will be impossible, as well as undesirable, to consider the manifold phenomena of this rather obscure disease.

The causation of each of the three events which form this tripod, or the influence or dependence upon each other, will receive very little attention. But the heart disturbance, which is nearly always present, and which is usually the primary of three characteristics, will be regarded as being due to derangements of the nerves supplying it, rather than as a result of the other conditions.

In a very small per cent of reported cases exophthalmus existed, with a pulse rate of only eighty-two per minute, and with no apparent palpitation, or other heart disturbance. However, this is very exceptional, and the history of the individual cases will show that there have been disturbances in the circulation for a long time before they were regarded as being of any importance; and the first serious notice is taken after great sorrow or an illness, whose tendency is to weaken the force of the nervous system.

Assuming that this malady is primarily a neurosis, it may be well to take a brief review of the nerve supply of the heart:

First: There are the intrinsic nerves and ganglia, located in the heart, whose function it is to keep the heart beating independently of the general nervous system. In mam-

malia, this action is of very short duration after the removal of the heart, but the heart of the frog, or terrapin, will beat for days under proper conditions, if fresh blood is supplied to circulate through it. These ganglia are automatic, however they are influenced by variations in arterial pressure, and are under the control of the cardio-inhibitory and accelerator nerves.

Second: The accelerator nerve, sometimes called the whip or spur of the heart, has its origin in the spinal cord, and joins the sympathetic nervous system through the last cervical and first dorsal ganglia. It is through the influence of this nerve and these ganglia that the pulse rate is increased.

Third: The inhibitory nerves, whose function it is to control the rate of the heart beats, does not excite, but slows, the action of the heart. These nerves originate in a collection of nerve cells in the medulla, known as the cardio-inhibitory center. In health, these cells are always in a slight state of excitation, and slow the heart's action.

The vaso-motor center is also closely associated with the cardio-inhibitory apparatus, and with the accelerator nerve, stimulating or depressing their respective functions. This center is, in turn, under the control of the depressor nerve, and is in connection with, and is influenced by, the sensory nerves. The existence of this nerve, the depressor, in man, is purely hypothetical, but it is surely there. Its fibers reach the heart with the pneumogastric nerve.

In the rabbit the depressor nerve is found in a separate sheath, and it is, therefore, possible to give it a careful study. It has two sets of afferent fibers, one set exciting the cardio-inhibitory center, and the other set inhibiting the vaso-motor splanchnic centers. That is to say, the former set stimulates the cardio-inhibitory center and slows the heart, while the other set inhibits the vaso-motor splanchnic center, allowing the splanchnic vessels to dilate and lower the blood pressure, and thereby remove that source of stimulation to the accelerator nerve.

It was my pleasure to study the depressor nerve in a long series of experiments with Prof. Henry Sewall, in the Physiological Laboratory of the University of Michigan, regarding the heart as a sensory organ. "Cyon and Ludwig observed no elevation of arterial pressure as a result of simple division of the depressor nerves, and concluded, in consequence, that the inhibitory action of these fibers on the vaso-constrictor center was not tonic or constant; but, in our experiments, section of the depressor nerves, performed as carefully as possible, was nearly immediately followed by a permanent rise of blood pressure, and we were led to believe that the depressor nerves, if not in tonic action, are at least extremely sensitive to changes in resistance to the heart's action."*

ETIOLOGY.— The malady often occurs in anæmic or chlorotic subjects, but anæmia or chlorosis do not seem to be essential, because it has been known to occur in fresh complexioned and otherwise perfectly-healthy-appearing individuals.

The neurotic origin or seat of the disease is frequently associated with mental derangements, with hysteria and with epilepsy. However, this co-existence is by no means universal.

PATHOLOGY.— This part of our knowledge is in rather an uncertain state. In certain reported cases the cervical sympathetic ganglia were degenerated, and in still a few other reported cases the medulla showed signs of degeneration. Either condition would suggest a satisfactory explanation of the abnormalities in the heart. The heart is primarily not diseased in an organic sense, at least that is the expressed opinion of all observers. However, after the rapid action has existed for a long time, permanent and very serious lesions are produced. The coronary arteries are not properly filled, and the heart muscle is not relaxed sufficiently to allow the blood to permeate its substance, and in consequence there is imperfect nutrition and weak-

* Journal of Physiology, Vol. VI, No. 4.

ening of the heart muscle. Dilation, or what is more disastrous, the various forms of degeneration may occur, and finally failure of the heart and resulting death. In cases where apparent hypertrophy is found, it is probably due to dilation; and after partial recovery, hypertrophy occurs as a result of overcoming the effects of dilation. I do not consider that these results are accidental, but directly due to the rapid action of the heart, and constitute one of the chief sources of danger.

The treatment has not as yet been as satisfactory as in many other diseases. The drugs that would suggest themselves to meet certain emergencies may be found to be without any effect.

Digitalis, the powerful and reliable heart stimulant, seems to be without any effect, so far as slowing pulse rate is concerned. Being pushed to its full physiological dosage and action, producing arterial tension of a high degree, the rate of the pulse remains the same. Wood states that in moderate doses digitalis stimulates the musculo-motor portion of the heart, increasing the activity of the inhibitory apparatus; and also produces contraction of the arterioles, probably by an action on the vaso-motor centers in the cord. The first action increases the strength of the cardiac beats and controls the rate, while the latter increases arterial tension.

Strophantus does not have as much effect upon the vaso-motor system as digitalis; the pulse is softer, but the heart is not slowed by its action.

Cactina and veratrum viridi depress the heart and soften the pulse, but have no appreciable effect upon the rate. The best hope of remedial results seems to lie in looking closely to the wants of the nervous system. Supplying nerve tonics and nerve feeders. If there be accompanying anæmia, it should be met with proper remedies. In any event, the general nutrition must be carefully observed, and the class of food best adapted to the case should be supplied.

CONCLUSION.— Considering the diagnostic value of the study of drugs in the disease, particularly the action of digitalis, would lead to the conclusion that the vaso-motor nerves are intact, but that the inhibitory apparatus had lost its control, it being remembered that arterial tension is increased by its action, while the rate is not affected. This loss of function may be explained in two ways. It might be caused by a derangement or degeneration of the inhibitory branch of the depressor nerve, or the source of departure might be in the cardio-inhibitory center.

It is not probable that the rapid action is due to an over excitation of the accelerator nerve, as there would be a temporary effect, at least, from full physiological action of the several heart agents.

Whether or not the thyroid gland has any causative effect in the production of the deviation of function, there is little at hand that affirms or denies. In common with the other ductless glands, the spleen and the suprarenal capsule, the thyroid gland is still surrounded by an air of mystery, and whatever the relation of the goiter and nerve lesion may be as to cause or effect, I am constrained to believe that the condition of the heart is directly due to a loss of function of the cardio-inhibitory center and the depressor nerve.

FRACTURES OF THE LOWER END OF RADIUS.

By B. W. Holliday, M. D., Cleveland.

Since 1814, when Colles contributed his classical paper on the subject, fractures of the lower end of the radius have received frequent notice at the hands of our best surgeons, so that one in my position must feel an embarrassment in discussing, perhaps, so thread-worn a subject. I need not say, therefore, that I have nothing original to offer. My object shall be accomplished if I draw out an expression from those here better qualified than myself, that will tend to unite us as to the best general management of this common and troublesome injury, or at least a common understanding as to its nature and varieties.

My own experience leads me to suggest the following queries for the sake of epitomizing the little I have to say:

1. Would it not be well to abandon the term "Colles Fracture," and substitute simply the phrase, "Fracture of the Lower End of the Radius?"

2. Do we sufficiently recognize the frequency of comminution, or at least fissure of the articular extremity of the radius?

3. Is impaction the rule or exception in this accident?

4. When impaction occurs, under what circumstances are we justified in, if possible, loosening that impaction?

5. When reduction in the average fracture is properly accomplished, does it matter very much what form of splint is used?

6. What are the usual causes of *unsatisfactory results* in this fracture?

I believe that Colles originally described this fracture as being within one and one-half inches of the lower extremity. Now, I find that scarcely any two authors give the same description, but I gather that the greatest number of this injury occur within the first inch of the distal extremity, and in very many much nearer the articulation. The silver fork deformity is called pathognomonic, but I am sure that many of us have seen the fracture complete without deformity. Such cases are frequently miscalled severe sprains. Localized pain and tenderness, with a careful search for mobility, will usually enable us to avoid a wrong diagnosis, which the mental picture of a typical Colles fracture will not do. Again, separation of the epiphysis, under twenty years of age, may exactly simulate this fracture; but while the mechanism of its production may differ, the treatment need not. Malgaigne gives just as good description of these fractures as any English authority, and yet he does not mention even the name Colles. Is his national pride of *omission* any more culpable than ours of *appropriation?* But chiefly because it is confusing to the student, leading him to idealize instead of generalize, do I think the name unfortunate.

I find authors differ in the importance which they attach to the frequency and consequence of articular comminution in this fracture. It seems to me this complication is not emphasized as it should be, for certainly were the diagnosis made at the time of injury, it would materially modify both the prognosis and treatment. And may not this fact explain frequently the imperfect result in otherwise excellently treated cases? In my opinion, it is a complication of much more frequent occurrence than is generally recognized, and should be carefully taken into account in selecting the mode and time of treatment.

Previous to 1865 (Callender, St. Bart. Hosp. report) the profession was much divided as to the cause of deformity, as laying between muscular action and impaction. But I believe now the division is more as to whether impaction

is the rule, or the exception, many holding to the former. My own experience leads me to believe that impaction, to a greater or less degree, is the rule in all well-marked examples of so-called Colles fracture. Now, when impaction is present, it seems to me plain that our treatment should vary. Age, sex, occupation and social position might justify or not justify a surgical interference.

When impaction is not so great as to render a satisfactory reduction impossible, I am satisfied that too great stress can not be laid upon the importance of a most painstaking effort in that direction. In thinking over my own cases, I can say that I never felt any great anxiety as to the choice of splints when I was satisfied that I had accomplished a nearly perfect adjustment of the fracture. On the contrary, if I failed to satisfy my judgment as to reduction, no form of splint has relieved my anxiety, although I have been sometimes happily surprised at the result of a continuous pressure and counter-pressure by means of compresses with straight splints. No doubt, chloroform might be of more frequent aid than it is in many of these difficult cases.

Finally, our treatment of this fracture should take into account the usual character and causes of unsatisfactory results. They are, deformity, loss of function of the wrist joint, and incidental stiffness of the fingers. Consideration of deformity should be made secondary to that of loss of function in the aged and those of rheumatic diathesis dependent on manual dexterity for a livelihood. So that in many cases that we meet it is questionable whether a very marked impaction should be disturbed. The simplest treatment consistent with preservation of function should be chosen—either no splints at all, or short splints without confining the hand, and these for a short time, two, or, at the most, three weeks. Young persons, especially ladies, have a right to expect of us the most careful adjustment possible, and that as a rule, neither marked deformity nor loss of function will follow, especially if the adjacent articulations are not involved.

My best results have followed a course something like this: With two light, straight, wooden splints, the first week confine the forearm, wrist, and fingers; at the end of the first week shorten the splints to liberate the fingers. At the end of the second week make careful passive motion and shorten the end of the anterior splint to the base of the styloid process. At the end of the third week remove both, or at least the anterior splint, and make daily passive motion. At the end of the fourth week the bandage alone, or with rubber plaster wrist-band, as advised by Roberts, and cautious daily exercise of all the joint motions for the following week. In deciding the adjustment in badly swollen wrists the relative level of the styloid process is of anatomical importance.

In brief conclusion, let me say that he who has fixed in his mind the normal anatomy of the radio-ulnar conformity at the wrist, the natural concavity of the radius at the usual seat of fracture, the normal position of the styloid processes, and that the typical Colles fracture by the rotation of the inferior broken fragments on one, and frequently both, axes, disturbs this concavity and styloid level, needs the help of no particular splint model. A shingle, jack-knife, spool of rubber plaster, and a couple of sheets of white wadding, constitute ample paraphernalia. He should be posted as to the possibility of Moore's ulnar dislocation, and the historical fact of Barton and Hamilton's splintering into the joint, and Smith's anterior, instead of posterior, displacement. But these exceptions need not disturb his equanimity in selecting a plan of treatment. Let him remember that any form of splint may do more harm than good; that positive reduction, when possible, is of first importance; that the mode and time of splinting must be guided by an anatomical and experienced sense, which will take into account the full extent of the injury, the age, sex, occupation, and diathesis of his patient.

ON THE LATER TREATMENT OF FRACTURES OF THE LOWER END OF THE RADIUS.

GEORGE W. CRILE, A. M., M. D., CLEVELAND,

Professor Physiology and Lecturer on Minor Surgery, Medical Department, University of Wooster.

I recently had under treatment at the same time two cases of impacted fracture of the lower end of the radius, each caused by a fall upon the palm. The first case, a German mechanic, of good clinical history, thirty-five years of age, in falling about four feet upon the hand, sustained a fracture. I examined the case within half an hour after the accident, and could make out distinctly on the dorsal aspect of the radius, about three-fourths of an inch above the articulating surface, the sharp margin of the upper extremity of the distal fragment. The line of fracture was from within outward. The hand deviated slightly toward the radial side; the ulna a little more prominent than normal. Every movement of the wrist was free and painless. The distal fragment was elevated, so it did not form an angle with the proximal fragment; the fragment was firmly fixed, and could not be moved. *Treatment.*— The hand, wrist, and forearm were well covered with absorbent cotton, over which a roller was closely applied, and the arm placed in a sling. Every second day the dressing was removed and passive motion given. In two weeks the patient returned to light labor; in four weeks, to his usual heavy work. Although there was some stiffness of the fingers in the morning, the swelling soon disappeared, and the recovery was rapid and complete, passive motion having readily overcome the stiffness present.

The second case, a man of sixty, intemperate, and with a history of several attacks of rheumatism, slipped down upon the icy pavement, striking violently upon the open hand. I first saw him several days after the accident, during which time he had been treated for a sprained wrist. The limb was greatly swollen to the elbow, edematous, discolored, and painful, under all of which a deformity could be clearly noticed. The line of fracture was an inch above the joint, the hand had fallen well to the radial side, the ulna prominent, and the inferior and superior fragments formed an obtuse angle at the point of fracture. Reduction being impossible, the arm was placed in a straight Palmer splint. At the expiration of ten days, when the swelling had somewhat subsided, passive motion was attempted, resulting in increasing the symptoms; even very gentle motion caused great pain and increased swelling. During the third, fourth, and fifth weeks inflammatory reaction still followed any attempts, however gentle, of passive motion. The limb was then put in a plaster of paris dressing for two weeks, much to the relief of the patient and improvement of the arm. During this time anti-rheumatic constitutional treatment and tonics were given. There was still considerable swelling, especially on the anterior surface of the forearm and in wrists; passive motion was again resorted to, but I was obliged to be very cautious; massage, hydrotherapy and local application of the tincture of iodine were continued. Fourteen weeks after receiving the injury patient resumed light work. After removal of the fixed dressing, at the close of the seventh week, a splint was still necessary in order to keep down the inflammation; every movement seemed to aggravate the symptoms. The bones increased in width about half an inch. The original deformity still persists. The wrist has almost perfect flexion and extension, less perfectly regained adduction and abduction. The fingers are again strong and supple. When improvement began it was rapid.

I have described these cases somewhat in detail, to illustrate my position on the subject of passive motion. Every one believes in thorough reduction of the fragment, and every one believes in sufficient retention by suitable appliances. In the majority of cases, I would be classed with those who advocate early passive motion. The first case cited is an example of a favorable case for this treatment; the second is typical of a class of cases in which I would advocate absolute physiological rest of the limb—advocate it as strongly as I would early passive motion in the former case. Physiological rest, with constitutional treatment, to remove or modify the cause of predisposition to severe inflammation from slight exciting causes. The indication for anti-rheumatic treatment in certain forms of pneumonia is not more urgent than in certain cases of fractures with a history of repeated attacks of rheumatism. Early passive motion in certain fairly well-defined classes of cases not only does no good, but augments the very difficulty we strive to overcome. It need not be said that passive motion should be made so gentle in these cases that reaction will not occur, for if there is motion enough to accomplish any good it will be equally powerful to do harm. I would not adopt fixed rules, but cast a glance beyond the recent local lesions to the general health equation, as well for indications as for treatment. I appreciate the value of early passive motion in most cases, but make a plea for limitations in a well-defined class representing a minority.

DISCUSSION.

DR. BALDWIN.

This is one of the most common fractures we have to contend with, and is so located as to show our good work or our poor work. In these cases, I think it is desirable to give an anæsthetic until there is complete relaxation. That being done, there is very little difficulty in getting the parts readjusted. Without anæsthesia I think we are very apt to get poor adjustment. With good adjustment, almost any

splint, or no splint at all, or the method of placing a rubber adhesive band around the joint, is all that is needed. From my cases, I have been convinced that proper adjustment will give satisfaction. The stiff joints will limber up in a year or more, and we get good results in very unpromising cases. I recently saw a case, some time after the injury was inflicted, in which there was considerable displacement. The parts were not in proper position, although quite likely in as good as they could be under the circumstances, but I think we will have a very good result, although the case was a very threatening one.

In my own practice, I have not been in a hurry to resort to passive motion. I use the short splint, and encourage my patients to use the fingers from the start. Good motion will, I think, come in these cases in due time, while I am certain we only inflict pain and keep up inflammation and swelling by resorting to passive motion too soon.

DR. REEVE.

I did not hear the doctor's paper, and it is possible the point I am going to present was given. However, the explanation of it was new to me.

A boy in a family I have always attended fell down stairs, fracturing the lower extremity of the radius. The fracture was reduced by another practitioner, and he afterward came under my observation. I dismissed him in due time. In the course of several months afterward I heard I was going to be sued for malpractice. I sent word for them to bring him to me, and I must say that, on examination, I was very much ashamed, for the styloid process was far down, and the hand was twisted very much out of position. I was unable to arrive at an explanation, until I afterward found that, when the epiphysis separates at the lower end of the radius, the growth of the bone is checked. That, undoubtedly, was the case here, and the radius ceased to grow while the ulna continued, and the hand was thrown over. Moullin is the only surgery I know of that mentions this point.

DR. HARMAN.

The case I wish to report occurred in an old lady, æt. 75, who had tuberculous skin and bones. In this case there was a fracture of the lower extremity of the radius, but

there was no trouble putting the two fragments in place. The patient made a perfect recovery, wearing a bandage about two weeks, and, although a very tuberculous woman, she lived to be ninty-five years of age. I have had equally good results from the use of a very light broad splint, the first week extending to the ends of the fingers. In my judgment the worst results depend quite as much on the attendant dislocation of bones of the carpus as upon the fracture itself, and I think frequently an error is made in the bandaging. The bandage is applied too tightly upon the carpus, leading to a great deal of infiltration of the bones of the carpus, and the disuse of the hand is quite as much the result of that as the dislocation of the bones of the hand. I have, therefore, been careful not to bandage these fractures too tightly and to get a good adjustment, and I always use chloroform in making my diagnosis, as well as in making the adjustment. Under chloroform you can determine the exact site and adjustment of a fracture, and can determine whether you have placed the bones properly. You know thoroughly what you have found and what you do, and it seems to me that this is the great secret of getting a good result. Use chloroform to complete anæsthesia.

UNUSUAL EXPERIENCE IN THE USE OF AN ANAESTHETIC DURING ABDOMINAL SECTION.

By Thad. A. Reamy, M. D., LL. D., Cincinnati,

Professor of Clinical Gynecology, Medical College of Ohio; Gynecologist to the Good Samaritan and the Cincinnati Hospitals.

Mrs. A. J. C., of Covington, Ky., referred to me by Dr. Walters, of that city, entered my private hospital March 20, 1893.

Family History.—Both parents died when patient was quite young. Father, of consumption; mother, of "hemorrhage of the womb."

Personal History.—General health always been fairly good. Menstruated at fifteen; normal. Married at nineteen; no children until two and one-half years ago. Thinks she may have had a miscarriage or abortion in her early married life; says that was the opinion of her doctors. The only child, born two and one-half years since, is living. Labor was normal. Soon after birth of this child she noticed a swelling of the abdomen, which has steadily increased until the present time. No pain or tenderness at any time.

Present Condition.—Age 33; slender brunette, thin and anæmic. Says she has palpitation of the heart; but the most rigid physical examination discloses no cardiac disease. Appetite good, but digestion poor; flatulence; bowels constipated. Urine, fifty-five ounces in twenty-four hours; specific gravity 1,012. No sugar or albumen. Lungs healthy. A pulsating lump as large as a hickory nut, situated just above and to the left of the sternal notch. Patient says this has been observed for the past

eight or ten years, and has not increased in size. At first I regarded it as an aneurism, but more careful examination disclosed that it was probably an enlarged lymphatic gland with transmitted pulsations. Abdomen enlarged equal to the full term of utero-gestation. Dullness and fluctuation everywhere. Uterus prolapsed to the second degree. Posterior and right culs-de-sac obliterated by downward bulging of the vaginal vault. Fluctuation in this region well-marked through vaginal touch.

DIAGNOSIS.—Cyst of the broad ligament, or ovarian cyst. The first most probable.

Abdominal section, March 23, 1893, 3 P. M. Present, Dr. Walters, of Covington, Dr. Magnus Tate, of Cincinnati, my nephew, Dr. Bonifield, and Dr. Mary Osborn, resident physician, who administered the ether. Dr. Bonifield assisting me in the operation.

The probable diagnosis was verified. The fluid was clear as from a mountain stream. There were no adhesions, and a pedicle was easily secured and ligated. The cyst was from the right broad ligament. No drainage. Abdominal wound closed by six silk-worm gut sutures. Time, from beginning administration of ether to close of tying last suture, was thirty minutes. The patient was anæsthetized without difficulty, becoming unconscious within four minutes after the first inhalation. Not more than three or four ounces of ether were used. The inhaler was the common paper and towel cone. Just as the last abdominal suture was tied, when the ether inhalation had been discontinued for at least four or five minutes, the respiration suddenly became extremely shallow and irregular, the face cyanosed, and the pupils widely dilated. The arterial tension was greatly increased, the pulse at the wrist being very strong and the carotids throbbing; the pulse rate, however, was but seventy-two per minute. The tongue was immediately drawn forward by the tongue-forceps, and cold water was dashed upon the face and chest. The head was somewhat lowered. No marked improvement

occurring, artificial respiration was attempted by elevating the arms and depressing them, likewise compressing the chest laterally and from the front, alternately. A hypodermic syringe was at hand and loaded with digitalis, but as the trouble was manifestly with the respiratory, and not with the cardiac centers, its use was not indicated. The cyanosis and shallow breathing subsided to a slight degree within six minutes after artificial respiration was commenced, but it was at least twenty minutes longer before conditions had sufficiently improved for the patient to be carried from the operating room to her bed. As respiration became more regular, and deeper, the pupils gradually contracted. Arterial tension was now somewhat lessened, but the number of pulsations per minute unchanged. Soon after she was placed in bed respiration again became shallow and irregular, face and lips purple, pupils dilated, arterial tension increased, hands and feet cold, nails blue. Smelling-salts were placed to the nostrils, alternate compression and elevation of the chest again practiced. Respirations now became deeper and more regular, lividity of face and lips less marked. Improvement continued for about forty minutes. The patient, who had been semi-conscious, now looked about the room, and was able to speak. Bottles of hot water had been kept about the extremities, and one to each side of the lumbar region. At 6 P. M., three hours after etherization was commenced, the temperature was 97, pulse 100, weak and somewhat irregular. At 9 P. M., temperature 98, pulse 120, weak; respiration 26, regular. No vomiting. Conscious. Ordered two drachms of whisky by the mouth. Ten P. M., temperatute 98½, pulse 110, somewhat fuller. Patient remained quiet, sleeping some, until after midnight. Two A. M., has vomited two or three times; temperature 98.8, pulse 128 to 134, counted at the chest, but so feeble that it could not be counted at the wrist. Had, hypodematically, one-fiftieth of a grain sulphate of strychnia. Soon after this pulse could be counted at the wrist, but was still

rapid. Six A. M., temperature 100, pulse 130, moderately strong. Respirations normal. Has continued to vomit occasionally. At 7 A. M., had per rectum, whisky 1 ounce, milk 2 ounces; retained. Nothing given by mouth except teaspoonful of cold water every half-hour; 10.30 A. M., temperature 99.4, pulse 126, respirations normal. Pupils normal. Mind clear. No pain. No vomiting. Four ounces warm water per rectum. Two P. M., temperature 98, pulse 110, respirations normal. Had per rectum, whisky 1½ ounces, milk and water each 2 ounces.

Patient was nourished during the next thirty-six hours by milk, whisky and water, per rectum. No further vomiting occurred. She made an uninterrupted recovery, and had gained several pounds in weight by the twentieth day after operation.

COMMENTS.

The failure of respiration, with marked lividity of the face, were precisely the symptoms to be expected from the excessive influence of ether upon the respiratory centers. These symptoms coming on so suddenly, after the patient had been for a considerable length of time under the anæsthetic, and bearing it beautifully, and when none had been administered for the last few minutes, were conditions not to be looked for.

Increase in the force of the pulse, with increased frequency, are conditions usually observed under ether anæsthesia; and the force of the pulse thus increased is usually maintained, though the narcosis may be prolonged.

The English Chloroform Committee conclusively showed that ether, by inhalation, markedly increases arterial pressure, and maintains it until respiration has been suspended. My own clinical observations and those of my former colleague, Dr. W. D. Porter, who for many years administered ether for nearly all the patients operated upon under anæsthesia in my private hospital, verify these observations. This increase of pressure is probably due to an

increase of the power of the heart, and to a stimulation of the vaso-motor nerve (H. C. Wood). In the case under consideration, it will be observed that the heart's action was not accelerated until several hours afterward, when the arterial tension had been so diminished that the pulsations could scarcely be counted at the wrist, and when coldness of the extremities, with reduction of the general body temperature, produced an aggregation of symptoms which bordered closely upon those observed in shock. The rapid pulse could here easily be accounted for, but the slow pulse during the high arterial tension, as stated, I am unable to explain. Moderate contractions of the pupils, associated with a total loss of sensation in the conjunctiva, are conditions usually maintained during ether narcosis. The excessive dilatation of the pupils maintained in this case, from the inception of dangerous symptoms until respiration was improved, is worthy of note. I scarcely think that the circulation of dyspuric blood would wholly account for it.

Acknowledgements are made to Dr. Mary Osborn, who had immediate charge of the patient, and from whose notes this paper is made up.

The subjoined letter, very kindly sent to me by my friend, Dr. Forchheimer, Professor of Physiology in the Medical College of Ohio, to whom I submitted this report for his opinion as to points involved, is of interest and instructive:

CINCINNATI, June 27, 1893.

My Dear Friend— The first of your phenomena is easily explained by paralysis of the respiratory center—either due to the ether directly or indirectly—the production of dyspuric blood, which, in its turn, stimulated the upper center for the dilator pupillæ muscle of the medulla.

The second of the phenomena is not easy of explanation. I take it to be a condition of rapid and weak pulse, with reduction in temperature, all being associated together. If the irritation is a central one, it can only be explained by irritation of the accelerating center of the heart in the

medulla. But if you take into consideration that, in your case, there had been prolonged irritation of the cardiac-inhibitory center, from the dyspuric blood, this in turn may have produced paresis of this center, to be followed up, after a little while, as in your case, by control of accelerating impulses followed, by the effect you noticed in your case.

It may not be amiss to state that all this must be hypothetical, for, as a matter of fact, while we know very much of the innervation of the heart in frogs, dogs, cats and pigs, our knowledge in the human being is practically confined to one or two facts. Yours as ever,

F. FORCHHEIMER.

DISCUSSION.

DR. W. H. HUMISTON.

This thought has occurred to me, while listening to the paper, that there might have been, in this case, a retention of urea in the blood, and that the nerve centers were and had been influenced for some time by this poison, rendering the manifestations of the anæsthetic peculiar and alarming.

DR. J. C. REEVE.

The paper is of importance to us all, since all of us use anæsthetics in daily practice. Such cases are not at all infrequent in the history of these agents, and it does not stand alone in the anæsthetic history of Cincinnati. They are cases in which the evil influence of the anæsthetic comes on after the administration has terminated. This case is a very clearly-marked instance of that, and it is of interest also because these cases defy explanation. There is no use trying to explain the mortality of different anæsthetics until you can clear up the cases in which bad effects show themselves, and go on even to death after anæsthesia is completed. You may lay it to the inhaler or to chloroform, or ether, or the A. C. E., but until you have cleared up such cases as the one just reported you will never settle these cases, or give an explanation of them. There is a case on record of this kind from chloroform which occurred in Cincinnati; the patient died suddenly five or six minutes after the administration ceased. Another case, which happened in Cincinnati, occurred from ether after the extirpa-

tion of an eyeball. The anæsthesia was over, and the operation completed so long that the surgeons were examining the specimen, when they suddenly found the patient in a dangerous condition. He was recovered with difficulty. These cases have happened both where ether and chloroform have been used, and I know of one case occurring when the A. C. E. mixture was employed. The dangerous symptoms came on after I had ceased administering the anæsthetic for fully two minutes. Until we understand these cases we can not explain the mortality from anæsthetics. The subject is one of the most interesting in connection with anæsthesia, and which very imperatively demands an explanation. To study these laws, which we know must exist, is our duty; but thus far the law that regulates the irregular action of anæsthetics after administration has ceased, we do not know.

DR. REAMY.

I have been interested and instructed by the remarks of the last gentleman, because I may say no man is more thoroughly conversant with the literature of this subject than is Dr. Reeve, and very few have had better opportunities for clinical study on the subject. However, even he regards this case as mysterious. I may be pardoned for referring to a point which did not receive attention from Dr. Reeve. I am aware that, in some of the fatal cases reported, the symptoms came on after the operation, and all that. The explanation is, in my opinion, often found in this: I have frequently noticed persons who are administering ether, or chloroform, after the patient is under the influence of the anæsthetic, in order to keep them under it, waiting until consciousness is partially restored. The cone is refilled, and the patient is again brought suddenly and profoundly under the anæsthetic. When she again comes out it is refilled, so on to the end of the operation; thus unnecessarily large quantities of ether are introduced into the system. These evils are best remedied by filling the cone to saturation of the cotton, bringing the patient suddenly under the anæsthetic, and not allowing consciousness to occur until the operation is ended. If the time does not exceed forty-five minutes, the cone need not be refilled. It is proper to state that all these precautions were observed in this case by Dr. Osborn, whose experience has been large, and whose sagacity is unquestioned.

I have had large experience in observing the action of large doses, thirty to forty drops, of Norwood's tr. veratveride in the pulse in the human subject, and during the excitement of the case, and subsequently sought, by analogy, to find in this field some explanation of the present case. Frequently have I observed the pulse under veratrum descend to thirty-five beats per minute. If the patient remain quiet, and with the head and chest low, the arterial force is, even under such large doses, but little diminished, especially at first. But under agitation the frequency of the pulse is markedly increased, and the force correspondingly diminished, as in exhaustion. Hovever, even in quiet, ultimately the arterial tension is powerfully diminished.

I am aware that in asphyxia the arterial tension is greatly increased, due, as is claimed, to vaso-motor spasm; but this fact fails to account for all the phenomena in my case. In this case, the arterial tension was immense. Never did I feel a more bounding pulse, round at both ends. At the same time, the number of pulsations per minute was normal. Later, after depression, when the arterial pressure began to recur, it was still 72, while later, when it went to 130 or 140, it was very feeble. These are things I could not explain. I at first thought that the tumor above the sternum might press against the artery in the position it was, or possibly might press on the downward trunk of the vagus. But then the symptoms would, from this cause, have come on earlier, because she did not change her position, and the heart ought to have gone faster instead of slower. I have, indeed, no explanation to make. This patient came nearer to dying than any case I have had. I have never lost a patient from an anæsthetic of any kind. I think I have, in several instances, seen them in the neighborhood of the crossing, but none went over.

THE SPIRILLUM OF CHOLERA.

By Leonard Freeman, B. S., M. D., Cincinnati.

There are two varieties of bacteria which closely resemble each other — the bacilli and the spirilla. The bacilli are little rods, which may be straight, or curved, or possess various other characteristics, but are never twisted around their long axes; while the spirilla are always twisted, like a corkscrew. The bacterium of cholera Asiatica is really a segment of a spirillum — it is not only curved on the flat, but is more or less twisted on itself; a point which is very difficult to make out, unless several bacilli are attached end-to-end. It is usually called, however, the "comma-bacillus;" and will probably continue to be called so, although the designation is not a strictly correct one.

It is a mistake to imagine that all cholera-bacilli are beautifully curved, like a printed comma. Most of them are, to be sure; but there are numbers which have but a slight curve, and some are scarcely curved at all. They are about half the length of a tubercle-bacillus, and somewhat thicker. Their ends are rounded. In the intestinal canal, and in most culture-media, they occur singly, or at most in pairs. When grown in certain fluids, under conditions which are not entirely favorable to their highest development, they form long, cork-screw-like chains. They have a lively motion. When viewed under the microscope, in a drop of water or bouillon, they rush about the field, and zigzag among each other in the most astonishing confusion. Their motion is produced by the sculling action of a sort of tail, or flagellum, attached to one end of the bacillus.

Brieger, Pfeiffer and others have demonstrated the presence of various toxic substances in cultures of cholera-bacilli, which produce symptoms of the disease when inoculated in animals. Alt has found certain toxalbumins in material ejected from the stomachs of cholera patients, which he claims are so characteristic that the diagnosis of the disease may be simplified by their recognition. Gamaleia has recently isolated a substance which he calls *nuclein*, which produces in animals all the symptoms of cholera, and which is rendered harmless by the presence of acids, for instance, in the stomach.

The spirillum of cholera probably forms no spores, as might be inferred from its slight resisting powers to various unfavorable influences; although Hueppe claims that *arthrospores* are sometimes produced. The growth of the bacterium of cholera in gelatin is one of its most characteristic points. When a little of a culture is taken on a platinum wire, and the wire plunged into a mass of nutrient-gelatin in a test-tube, a growth soon takes place along the entire inoculation-track; but it is much more pronounced near the surface, where there is plenty of oxygen. Evaporation of the liquified gelatin rapidly occurs, leaving a funnel-shaped hole or bubble in the culture-medium. On gelatin plates the colonies also produce these "bubbles."

The cholera-germ not only grows luxuriantly within the human intestinal canal, but it will also multiply on various substances outside the body; which fact facilitates its transmission from man to man. Certain conditions, however, are necessary to its proper development:

1. It requires moisture. This is a very important point, and should never be lost sight of. When deprived of moisture, a few hours at most will suffice to destroy it as effectually as the most searching disinfection. Under certain artificial conditions, however, as when dried on silk threads in a desiccator, as shown by Kitasato, it may be preserved for a long time. The danger of the transmission of cholera by letters, dry clothing, and other articles

devoid of moisture, is slight; but moist clothing—imperfectly dried wash, for instance—moist fingers, etc., may be dangerous in the extreme. It is easy to recognize the absurdity of some of the methods of disinfection which have been employed. For instance, tightly-packed trunks are placed in a close room, the lids thrown back, and steam turned in. The only perceptible effect of such a maneuver is to increase, perhaps, the surviving-chances of the bacteria by furnishing them with an increase of moisture. Unpacking the trunks, and drying their contents, would be much more effectual. No good can be accomplished by the watering of streets in cholera times, as is often strongly advocated. The bacilli can only fly in the air with the dust when they are dry; but if they are dry, they are dead. In attempting to disinfect a room, it is better, under ordinary circumstances, to build fires, throw open doors and windows, and trust to plenty of air and sunshine, rather than to sprinkle a little carbolic acid about the place, or to depend upon other and even more doubtful methods. Flies, however, may become a source of danger; for Simonds has shown that cholera bacilli may remain upon the feet of these insects an hour and a half before drying kills them; to say nothing of the fact that they may pass unharmed through a fly's intestinal tract.

2. The cholera-germ grows best at the temperature of the body; but it thrives luxuriantly enough at what is known as "room-temperature," about 22° C. It does not multiply above 42° C., nor below 15° C. Temperatures over 50° C. are rapidly fatal.

3. It is very sensitive to chemical agents of various kinds, especially to mineral acids; although it grows well enough if the acid is of vegetable origin. It is killed almost instantly by the gastric juice. Some claim that the regular drinking of small doses of hydrochloric acid is an excellent prophylactic measure. Stutzer and Burri assert that the best way to disinfect cholera dejections is by means of diluted, cheap, sulphuric acid.

4. A liberal supply of oxygen is necessary to the growth of cholera spirilli. This is seemingly contradicted by the fact that they grow so freely in the intestinal canal, and by the fact that they develop rapidly when inoculated within an unbroken egg. The explanation probably is, that they obtain oxygen by splitting up the molecules of certain substances by a process of reduction.

5. Under almost all conditions they are easily overgrown and killed by other bacteria; for example, those present in processes of putrefaction. Special conditions, about which we know little, enable them, at times, to hold their own; for instance, when they are present in great numbers, or in river water containing large quantities of saline or sulphurous compounds. Hence it may be said, in a general way, that decomposing garbage and filth of various kinds are not the source of so much real danger as is generally supposed. In fact, our salvation as regards cholera lies not so much in cleaning up our cities as in the cleanliness of individuals; although, according to the newspapers and to many doctors, one would imagine that if our cities were burnished up a bit, we would be as safe as if we dwelt in jars of carbolic acid with the lids screwed down. It should be impressed upon the people at large that every man who wishes to avoid the scourge should take care of himself, and not depend too much upon the health officer; and he should be taught how to do it, too.

The germs of cholera flourish in sterilized milk without changing it in taste or appearance. The same is true of unsterilized fresh milk. But as soon as souring begins, the lactic acid inhibits the growth of the bacilli and then kills them. Sufficient time elapses, however, to allow of the virus being distributed to many people. It is easy to understand how milk may become contaminated through its dilution with impure water.

Cholera germs can live a long time in sterilized water, and even multiply in it for a few days. Experiments in the laboratory seemed to demonstrate, however, that when

the water was impure, that is, filled with myriads of other organisms, the spirilla were soon forced out of existence. But the conditions under which these experiments were made were more or less artificial, as has been proved by Koch and others. Koch found the bacteria of cholera in the contaminated water of an Indian tank — a place where natives wash their clothes, bathe, empty their sewage, and get their drinking water. Since then they have been found frequently enough, especially during the recent epidemic, in specimens of water from cholera-infected districts. It has been demonstrated that they can live in such water three or four days at least.

Perhaps the most effective way of staining the spirillum of cholera is with a weak Ziehl's solution (the composition of Ziehl's fluid is, 5 parts each of fuchsin and carbolic acid in 100 parts of water). Ordinary analine stains may be employed, although the staining process is slower than with most other micro-organisms.

One of the most important and perplexing questions will always be, how to determine the beginning and ending of an epidemic of cholera. A suspicious case occurs in a community; is it cholera? It is sometimes impossible to make a diagnosis from symptoms alone, in certain forms of disease; for instance, cholera nostras, cholera infantum, peritonitis, in some of its varieties, and in poisoning with arsenic and with certain organic poisons. Even some forms of uræmia may be very confusing, as was the case in Cincinnati during the recent cholera scare. The only way to settle the question with any degree of exactness is by a bacteriological investigation, which, when properly conducted, is almost infallible. The spirillum can be found in the contents of the intestines in every case of Asiatic cholera, and it is never found under any other circumstances. To be sure, there are many other curved spirilla which closely resemble it; but they differ in important respects, and are much oftener found in impure water than in the alimentary tract of man, in spite of the assertions of

some observers. The cholera spirillum has been detected as a factor in every epidemic in the most widely separated countries — in Germany, France, Italy, South America, the United States, Russia, India, Egypt, etc. Fraenkel and Deycke detected it in the material derived from all those who died within the first six days in the Effendorff Hospital. Rumpel and Schmidt found it always present in 470 examinations of cholera dejections. The results obtained by many other investigators are equally convincing.

The older methods of examination—in drop cultures, on potatoes, and in gelatin—were accurate enough, but they required too much time. Even an experienced bacteriologist could scarcely hope to reach a result in less than two days, and the time required was often nearer five days than two. In the meantime, the disease improved the opportunity to spread far and wide, as was the case in Hamburg. Various experimenters have recently contributed to the perfection of much-improved methods, which have been clearly formulated by Koch. They consist in the intelligent use of the microscope, of peptone-cultures, the indol-reaction, agar-plates, gelatin-plates, and in the inoculation of guinea-pigs.

It has been found that cholera spirilla grow particularly rapidly in an alkaline, aqueous solution of one per cent each of peptone and sodium chloride, and they seem to hold their own more successfully against the attacks of other bacteria. They develop principally near the surface, along with a few other similar spirilla, where there is a good supply of oxygen. The ordinary fæces-bacteria grow deeper down in the medium. Such a peptone solution is inoculated with a small portion of a cholera dejection, or other suspicious substance. As soon as a slight cloudiness appears, which usually occurs in six to eight hours, the upper layers of the fluid may be tested further for the presence of the characteristic spirillum. If this examination is put off too long the uper layers will become filled with other bacteria, and little will be gained by the method.

When cholera spirilla grow in bouillon, or gelatin containing peptone, or in the peptone solution mentioned above, they liberate indol and a certain proportion of nitrates. The addition of a small quantity of sulphuric acid gives the well-known indol-reaction, known in this connection as "cholera-red." The medium assumes a reddish-violet or purplish-red appearance. This, under proper conditions, is absolutely characteristic. In order to be of real value, a pure culture of the germs must be used; the peptone must be of the right kind (that of Witte, in Rostock, is recommended); and the acid must be chemically pure; that is, must contain no nitrates.

A word about agar-plates and gelatine-plates. Agar-agar is a translucent, vegetable jelly, resembling gelatin; but, unlike the latter, remaining solid at the temperature of the body. This substance, when properly prepared with peptone, salt, etc., is sterilized and spread out in covered glass dishes. A bit of the material under examination is smeared, by means of a platinum wire, over the surface of the agar; and the dish is placed in a brood-oven, and kept at a temperature of 37° C. for eight or ten hours. The various germs, having been spread out in a thin layer, and more or less separated from each other, grow into distinct, rounded colonies. A thoroughly practiced eye is able, under the microscope, to pick out such colonies as resemble those of cholera, which are then subjected to further investigation.

In the preparation of gelatin-plates, the suspicious material is mixed with the prepared and sterilized fluid gelatin, which is then poured in thin layers on glass plates, or into shallow covered dishes, and allowed to become solid. After this it is kept at as high a temperature as possible without melting (22° C.) until the colonies appear, which they do in fifteen to twenty hours, Being distributed all through the gelatin, many of the colonies develop beneath the surface, and produce their characteristic bubble-like appearance; while in the agar-plates they are

all superficial, and have the advantage that they can be picked off for further investigation without difficulty.

The cholera spirillum is the only curved bacterium that can come in question, which, when injected into the peritoneal cavity of a guinea-pig, will rapidly produce death with certain characteristic symptoms, including sub-normal temperature. The poison to which this peculiarity is due, lies in the spirillum itself, according to Pfeiffer, and not in the culture-medium; hence, the material for inoculation should be taken from an agar-plate, so as to get nothing but the germs themselves in sufficient quantity and in pure form. These germs are mixed with a little sterilized bouillon, and thrown into the peritoneal cavity with a hypodermic syringe.

The rapid examination of cholera dejections is conducted, according to Koch, briefly, as follows:

A flake of mucus is picked out, if possible, because these flakes are more apt to contain spirilla. This is dried on a cover-glass, in the usual manner, and stained with thin Ziehl's-fluid. If, on microscopical examination, clumps of curved bacilli are found distributed along the smear of mucus, all lying with their long axes parallel to each other, like a school of fish in a riffle, cholera may at once be diagnosticated with certainty. Again, if this peculiar arrangement fail, but a number of spirilla resembling those of cholera are seen scattered about the field, with no other bacteria present, except the bacillus coli, the diagnosis is equally certain. In fact, the microscopical diagnosis becomes uncertain only when the mixture of bacteria is a complicated one. It is easily understood, however, that this kind of work requires a practiced eye and an extensive experience, and, like the other processes involved in the bacteriological diagnosis of cholera, should not be lightly undertaken by those of limited experience.

According to Koch, about fifty per cent of the cases presenting themselves for investigation may be diagnosticated in this rapid manner, and *were* so diagnosticated in the Institute for Infectious Diseases last Fall.

In case there should be any uncertainty about the microscopical examination, gelatin-plates are at once poured, and peptone-cultures started. At the end of six hours it is well to begin examining the latter for cholera-like microorganisms. As soon as they appear, fresh peptone-cultures are prepared, in order to get the germs in greater purity, and agar-plates are inoculated. In six to eight hours the peptone-cultures are ready to test by the indol-reaction, and in eight to ten hours the agar-plates show colonies large enough for diagnostic purposes. If the indol-reaction is positive, or there are a number of cholera colonies present on the agar-plates, the diagnosis may be made by an expert at once. If the colonies are few, or if any uncertainty exist, the investigation must be carried further. The agar-plates must then be carefully searched for suspicious colonies. If any are found, fresh agar-plates and fresh peptone-cultures are started, in preparation for indol tests and inoculation in guinea-pigs.

It is seldom necessary, however, to carry the investigation through all its possible stages; a definite result being usually obtained within a day, and two days sufficing for the most difficult cases.

The examination of water for the spirilla of cholera presents many difficulties. By the older methods only a drop, or even half a drop, could be used for cultures at one time; and where only a moderate number of cholera germs were present in a large body of water, which is the case in contaminated rivers, reservoirs, etc., it was a lucky accident, indeed, if any were discovered. And again, other bacteria are very numerous in impure waters, and soon overgrow, in the cultures, the few spirilla which may be present. A recent method, highly recommended by Koch, is to add one per cent. each of peptone and gelatin directly to 100 ccm. of the water to be examined. As in the ordinary peptone cultures, the bacteria of cholera multiply rapidly in the superficial layers of the fluid; and from these layers agar and gelatin-plates may be poured, and the indol-reaction

and tests on animals carried out. In this way a number of positive results have been obtained.

It will be appreciated from the foregoing sketch of the subject that the bacteriological diagnosis of cholera requires special laboratories, and specially trained men; and that most physicians can hope to possess neither the requisite time, apparatus, nor training to thoroughly fit them for the work.

CHOLERA: ETIOLOGY, PREVENTION, AND TREATMENT.

By D. N. Kinsman, A. M., M. D., Columbus.

The history and symptomatology of cholera are so familiar that we have omitted their consideration.

ETIOLOGY.

Since 1884 Koch's comma bacillus has been recognized to be the cause of cholera Asiatica. In every epidemic cholera Asiatica and choleran nostras prevail side by side, and they can not be separated by any clinical examination. Both forms are alike mortal. Bacteriology can alone decide which is epidemic and infectious, and which is local, sporadic, and benign.

Microbes attack the organism in two ways. In one they produce intoxications, in the other septicemias. But they may be joined in the same organism, and the condition produced will be the combined action of both, *i. e.*, an intoxication and a septicemia. The first class of microbes, when introduced into the organism, multiply *in situ*. They there produce their toxines and albumoses, which are absorbed by the lymphatics and carried into the blood. The microbes themselves are never found in the blood or other fluids. Cholera, diphtheria, and tetanus are caused by toxine-producing microbes. The cholera bacillus, under favorable circumstances, multiplies in the intestines, the toxines produced by them are absorbed, and thus the intoxication of cholera is produced. Microbes producing septicemia are found in the blood and disseminated in the organism. When both kinds of microbes are present it

has been observed that the septicemic germs unfavorably impress the organism and produce many of the graver symptoms which are shown near the close of fatal cases, or even in severe cases which recover.

In diphtheria and cholera sepsis complicates the intoxication, and causes death in cases otherwise hopeful. In cholera, as in other diseases, we are obliged to assume that the virulence of the microbe varies greatly. The culture-medium, light, temperature and atmospheric conditions are known to influence the bacillus *in vitro*, and so reduce its activity as to require reinforcement by special culture before the characteristic effect can be produced by inoculation. This accounts for the want of relation between the number of bacilli and the intoxication. In cultures the bacillus multiplies greatly; at the same time, the microbes give up to the surrounding fluid their toxines, so that when these cultures are filtered to remove the bacilli, or the microbes have been killed by heat, the fluid which remains produces the characteristic intoxication when it is injected into animals. Therefore, the toxines of the bacillus produce the cholera.

On this experimental basis we rest our theory of the Etiology of Cholera.

The bacillus multiplies in the intestines, produces therein its toxines, which are absorbed, and the result is cholera intoxication, proportional to the amount absorbed. The colics, cramps, vomiting and diarrhea, the hypothermia and collapse are the evidences of the poisoning. This is sometimes so acute that the organism is overwhelmed, and there is collapse and death without the other symptoms. Strauss reported such cases in which the post-mortem showed the intestines stuffed with almost pure culture. These are cases of cholera sicca. Then we conclude that the comma bacillus, in its various forms, is the sole and unique cause of cholera Asiatica. No bacillus—no cholera. As in typhoid fever, the laboratory where the bacillus and its toxine is produced is the intestinal cavity.

They escape from the bowels and when, by contaminated water or food, or when carried, perhaps, by currents of air, they again find a favorable situation in the intestines of another patient, the disease is continued by a process of constant propagation. It seems evident, at present, that most cases are transmitted by means of water, but this can not in all cases be demonstrated.

A most careful investigation of the water of the Elbe, during the epidemic at Hamburg, in 1892, failed to demonstrate the spirillum of cholera. How cholera gained its foothold in that city is yet unknown. When it came it seemed to spring up in all sections of the city, and the most probable source is the water supply, although not proven.

There were eleven cases of cholera in New York in 1892, nine of which were fatal. In all cases in which a bacteriological examination was made the spirillum was found, which completed the diagnosis. How and when the cholera penetrated the quarantine at that point is still unknown. Despite an apparently rigid quarantine the city was invaded. The cases were extended over a large territory, bounded by the Hudson and East rivers, and Houston Street on the south, and Eighty-sixth Street on the north. There were four cases on the East river front, two on the Hudson front, the remaining five being scattered over this broad area.

When cholera penetrated the quarantine at Toulon in 1884, all possible care seemed to be taken, and yet, how cholera gained entrance is still a matter of conjecture.

The one important fact to be noted remains that, although no contact with cholera cases could be traced, and merchandise was fumigated before it was received into these cities, cholera got there just the same, and that was demonstrated by the presence of the spirillum in the dejections of the sick and the bodies of the dead. The course of former epidemics had taught us that cholera traveled just as fast as men and merchandise moved, and in the

same directions, telluric and atmospheric influences were secondary. The epidemics always marched along the highways of commerce and travel.

Lesage and Macaigne, at the Hospital of St. Antoine, examined two hundred and one cases of cholera bacteriologically in 1892. They publish the following conclusions. *Annales L'Institute Pasteur, 1893.*

There are four types of cholera in these cases.

1. Those in which the comma-bacillus and bacterium coli exist together.

2. Cases in which they found comma-bacilli, bacterium coli and other microbes.

3. Cases in which bacterium coli only were found.

4. Cases in which they found bacterium coli and other microbes, but no comma-bacilli.

There were no cases in which comma-bacilli were found alone. In twenty cases, in which the comma-bacillus was present in large numbers, fourteen recovered, six died.

In one hundred and nine cases, in which the comma-bacillus was present in medium numbers, sixty-one recovered, forty-eight died. In twenty-four cases, in which the bacilli were present in small numbers, sixteen recovered and eight died. Three deaths occurred in which bacterium coli and other bacteria only were discovered.

They also observed that those cases only had the secondary fever, which had large numbers of bacterium coli present. They sum up their conclusions as follows:

1. In the epidemic observed by us there were many varieties of microbic cholera, which it is impossible to distinguish clinically.

2. In the first variety, comma-bacilli have never been observed pure, but ever associated with bacterium coli and other microbes.

3. A number of cases may be separated and described as cholera, due to bacterium coli.

4. There is no relation between the number of comma-bacilli and the gravity of the disease. A case of simple diarrhea may show an abundance of comma-bacilli.

5. Mild and grave forms of cholera are seen among these different bacteriological varieties. The presence of comma-bacillus is not necessary.

6. Microbic invasion of the cadavers occurs progressively during the first hours after death.

7. Febrile reaction in cholera appears to be due to the bacterium coli, the presence of which is established in the organs immediately after death.

Another feature which Cantani and others have observed in the recent epidemic in Europe is worthy of mention. Many cases of transient diarrhea occurred of no great importance to the patient in whose stools the comma-bacillus was found. This emphasizes the necessity of regarding all diarrheal diseases as choleraic when in the presence of an epidemic. The stage of incubation of cholera is three days.

PREVENTION.

Cholera is a mortal disease. Medical treatment so far has not been satisfactory, hence measures of prevention must be used largely in our combat with this malady.

The experience of the past has, I think, demonstrated that maritime quarantine can not alone be trusted to keep cholera out of our country, and while I would by no means abandon the attempt, it should be so conducted as not to disorder trade, or cause unnecessary hardship to travelers who are found on board cholera ships.

The fight against cholera must be made in our cities themselves. I have but few suggestions to make in this direction, for our city health departments are now well instructed on most of the points of public hygiene, however little they obey its precepts.

1. In the first place, every town should have a full supply of pure water, collected from such sources as to render its contamination impossible.

2. Upon the approach or outbreak of cholera, measures should be taken to have every case of diarrhea, or disease

of sudden and unusual occurrence, reported at once to a central bureau of health.

3. Bacteriological examinations should be provided in every epidemic by every board of health. By this means alone can we be sure of our diagnosis, and it furnishes an essential indication for the management of our cases and the premises where they occur.

4. A sanitary force should be on duty night and day to remove the sick to some central hospital in case of need, and supervise subsequent isolation and disinfection of the premises.

5. The community should be instructed that all discharges from choleraic sick should be collected and disinfected, and all soiled clothing removed and exposed to boiling water or burned, as by this means alone can the extension of the disease be prevented.

6. In matters of personal hygiene equal care should be exercised. All fruits and vegetables should be cooked during the epidemic, and all water should be boiled, but if treated to filtration, through a Chamberland filter, I think it would be sufficient. Temperance in eating and drinking should be inculcated.

7. All cases of cholera, and all families wherein they have occurred, should be rigidly isolated, and the premises disinfected when danger has passed of further extension.

The comma-bacillus dies in acid and thrives in alkaline media. As prophylactic measures, drinks, acidulated with vegetable or mineral acids, have been used during epidemics of cholera with apparent advantage.

IMMUNITY BY INOCULATIONS.

A single attack of some infectious diseases protects from a subsequent attack. The term of this protection varies as to duration, being short in many cases, and extending in some diseases through all subsequent life. But it is still

an open question whether immunity is ever absolute. Extraordinary exposures may overwhelm this power.

Immunity is produced:

1. By vaccination with the chemical products of bacteria, or the proteids which they give up to the culture media.

2. By inoculation with pure cultures which have been attenuated by heat, light, and various media.

3. By the injection of the serum of already immune animals.

The process of inoculation accustoms the cells of the body to the presence of toxines of the bacteria gradually, by the use of weak vaccines which are followed by stronger. They may be required many times, as in Pasteur's vaccinations against rabies. Our own experiments upon hog cholera have demonstrated that three successive vaccinations were necessary to render the hogs immune to the strongest virus of this disease.

Persons who have suffered one attack from cholera rarely suffer again in the same epidemic, although they continue to live under the same conditions after as before. Where a disease is endemic it never becomes epidemic. In the inhabitants of those regions there has been an acclimatization, so called.

The protective power of a previous attack, and the relative immunity acquired by residence at a focus of the disease, have led to experiments in inoculations. Ferran, in 1885, claimed great success from inoculations. In the province of Valencia, sixty-two per thousand of the population were attacked, and thirty-one died. Of thirty thousand four hundred and ninety-one inoculated, three hundred and eighty-seven were attacked, and one hundred and four died, or three per thousand. The subject has since been studied in the laboratory by Pfeiffer and Wasserman, Kitasato, and others. In the May, 1893, issue, Annals de l'institute Pasteur, Metchnikoff has given a resume of the work hitherto done, and the results accomplished.

It seems to be proven that the blood serum of one-half, or fifty per cent, of Europeans, when injected into the

cobaya, will preserve them from the effects of a mortal dose of Koch's bacillus. The effect of the serum of the other half is nil. Fifty-eight per cent of those who have recovered from cholera have a blood serum possessing similar properties. Nearly all animals are immune to cholera. In the recent outbreak of cholera in Europe it was found that persons whose dejections contained large quantities of comma-bacilli remained well, or only suffered from a slight and harmless diarrhea. On the other hand, the pure cultures of the comma-bacillus have been swallowed by many experimenters, both in connection with alkaline agents, and without, without any manifestation of disease beyond a diarrhea. This virus has been taken from cases which were mortal and benign, and the result has been the same. The experiments on the cobaya enable us to understand this relative immunity.

Ferran, Haffkine, and others have performed inoculations upon human beings. There can be no question that they produce immunity by this means. Haffkine reinforced the virus by successive passages thereof through the peritoneal cavities of the cobaya, and uses in succession a weak and a strong virus. The essential factor, in the production of immunity, I believe, is phagocytosis. The introduction of the virus by inoculation accustoms the leucocytes to the presence of the poison, and converts a negative into a positive chemotaxis.

TREATMENT.

Shakespeare says: "It has often happened that the ratio of deaths to the number of pronounced attacks has been nearly as great under the management of skillful and experienced European physicians as in the hands of native East Indian attendants, whose chief reliance is upon charms and invocations." A stronger illustration of the futility of ordinary modes of treatment could scarcely be given.

The following is a summary of Cantani's method of treatment:

First period of cholera, or diarrhea: Rest in bed; warm infusions, with chlorodyne, laudanum, and brandy; warm bottles to feet; warm general baths, and warm enteroclysters. Certain cure.

Second, specific, or rice-water, diarrhea: Warm bath; lemonade acidulated by hydrochloric or tannic acid; laudanum; spirits; warm tannin; enteroclysters; lumps of ice to be swallowed. Cure almost certain.

Third period, vomiting more profuse, cramps, coldness, beginning cyanosis: Hypodermic clysis; warm baths, alternated with enteroclysis; hypodermic injections of stimulants; revulsives externally. Very many cases recover.

He uses the following by enteroclysis:

℞ Boiled water.....litres ii
Tannin.....grammes v to x
Laudanum.....gtt. xxx to l
Powdered gum Arabic.....grammes l

This is administered by means of a fountain syringe at the temperature of the body or higher, and should be used at once in all cases wherein rest and a dose or two of chlorodyne does not relieve. By this means the entire colon can be filled, and even the iliocecal valve passed with the solution. All cases of the first degree recover, according to Cantani, under this treatment. In case the patient falls into collapse, he practices hypodermoclysis, which consists of injecting into the cellular tissue of the groin, or elsewhere, the following solution:

℞ Pure sodic chloride.....80 grammes
Sodium carbonate.....6 grammes
Boiled water.....2 litres.

This amount or less may be injected, in fifteen or twenty minutes, by means of a fountain syringe, a long tube and

a perforated needle; the resulting swelling is diffused by rubbing. This operation can be made while the patient is in a hot bath.

Stewart and Sternberg have recently brought forward the naphthols as agents to be used in the treatment of cholera. Laboratory experiments show that these agents have a strong toxic effect upon the cholera spirillum. Both the alpha and beta naphthols may be used per os in from fifteen to twenty grain doses in the early stage, and by enteroclysis in the algid stage, in combination with other remedies. They state in their article that from eight and one-half ounces to twenty and five-eighth ounces would be required of pure alpha naphthol to produce toxic symptoms. They cite as their authorities Bouchardat and Maximovitsch. For enteroclysis they recommend one part of alpha naphthol to one thousand of Cantani's solution, minus the tannin. They say nothing could be expected from beta naphthol by enteroclysis.

In the epidemic at Hamburg, Klebs used anti-cholorin inoculations. Sterilized cultures of the bacilli were filtered, the filtrate concentrated by heat then as he supposed, the toxine by alcohol. The substances which remained he called anti-cholerine, and with them he inoculated patients suffering from cholera. The mortality following these injections was 67.7 per cent. These results are not promising.

Prof. E. B. Fullerton, of Columbus, has recently published a remarkable article in the *New York Medical Record*, on the use of Quinine in Cholera. He concludes, from his own experience in 1873, and from an analysis of all the records of cases treated by quinine contained in medical literature, that treatment by this agent has been the most successful ever used. The mortality in collapsed cases, according to his statistics, in 101 cases, was fourteen per cent. In all grades of cholera, out of 679 reported cases, the mortality was forty-eight.

Quinine should be exhibited by the mouth, in doses of seven and one-half to fifteen grains in an acid solution,

every fifteen minutes or half an hour, or even in a watery mixture. Capsules, pills, etc., are not to be used. Entero clysm, by the use of a watery solution of quinine, he also recommended.

Morphine may be used hypodermatically to relieve pain or cramps.

One common indication is kept in view in each of these three forms of treatment. That is the inhibition of the growth of the bacillus.

CONCLUSIONS.

1. Cholera is an infectious disease.
2. Koch's bacillus is its cause.
3. The force of the bacillus and the receptivity of individuals vary greatly.
4. Isolation and disinfection are our most efficient measures in its prevention.
5. Inoculation has prophylactic powers, but it can not be generally used in the face of an epidemic in present conditions.
6. If anything is ever accomplished in the therapeutics of cholera, it must be done by new methods, the old have failed.
7. All diarrheas during an epidemic of cholera should be treated as cholera.

TREATMENT OF CHOLERA BY THE RESTORATION OF FLUIDS.

By G. A. Collamore, M. D., Toledo.

One of the most obvious symptoms of cholera is the rapid loss of the fluids of the body, drained off through the intestinal canal. These discharges are well-named "rice-water," from their appearance, and consist of a fluid which is nearly the same as the serum of the blood, including the vast quantities of epithelial cells from the mucous membranes. It is as though the vaso-motor nerves were paralyzed by the choleraic poison, and permitted the escape of the fluid portions of the blood. The results are obvious. The blood, deprived of its serum, circulates with more and more difficulty, and finally stagnates and stops, corpuscles and other solids forming a jelly-like mass, mainly arrested in the veins. The other familiar symptoms accompany this process, especially the algidity of the surface and failure of pulse; the arteries are emptied; the patient is moribund.

There is no doubt that, under these conditions, no indication is stronger than to restore to the blood the fluids it has lost, and without which life can not continue. Two questions here arise: What fluid shall be used in place of the lost serum? and in what manner shall it be restored to the circulation? As the case differs from a hemorrhage, in which the blood is lost in mass, it is not necessary to supply blood itself. It will be sufficient to supply some fluid resembling more or less the blood serum. Without discussing the various substitutes which have been devised and employed in times past, it is now found that a solution of common salt in sterilized water—six parts of salt to a

thousand of water, or a heaped teaspoonful to a quart—fulfills all conditions, and is always readily available.

Secondly, where shall it be introduced, so that it shall become accessible to the blood still left? There are four methods in use, each of which has its advantages. The first is the flushing of the bowels by enema, large quantities of the fluid being thus introduced. It has the advantage of being readily applied by one who need not be an expert, and also the additional advantage that other remedies may be also dissolved in the solution, rendering it at the same time inimical to the cholera bacilli and their products. Its disadvantages are, that as the circulation through the intestinal vessels is now feeble and slow, it is improbable that any large proportion of the fluid can be absorbed or pass into the veins by osmosis. This application of the fluid has been termed enteroclysis.

A second method is that of hypodermoclysis; the fluid is thrown into the areolar tissue in various parts of the body by the hypodermic syringe. Experience has shown that quite large amounts of fluid can be introduced in this way, even to several pints. The absorption is assisted by gentle massage over the part. The advantages are the certain application of the fluid in the neighborhood of the circulatory system and its innocuousness. The disadvantages are to some extent those suggested under enteroclysis. The feebleness of the blood flow and the over-fulness of the veins prohibit access to their interior to any great degree. Nevertheless, this method has been successfully employed, and is worthy of trial in not too desperate cases.

The third method is the introduction of the fluid directly into the veins, which may be termed endovenoclysis. This has been in use since 1832. At that time the results were regarded as unfavorable. In 1849 and 1867 it proved more successful. Stillé says: "It is true, however, that much more frequently it failed of success; and probably not only because the injection could not reach the heart, but because,

having permeated the blood-vessels of the whole body, it escaped, as the serum of the blood had done, from the damaged intestine. Nevertheless, it would seem that an expedient, which in a certain proportion of cases has been quite successful, might yet be rendered more certain in its results if the operative procedure were perfected."

The fourth method is by introduction of the fluid directly into the arteries, or endo-arterio clysis. This is the latest method, and one claimed to be perfectly safe and eminently successful under proper antiseptic technique.

The appliances required are a hypodermic needle, and an ordinary Davidson's syringe, to which the needle is directly attached. Fill the syringe with the salt solution, at a temperature of 110° to 120° F.; insert the needle into the femoral artery, just below Poupart's ligament, pushing it slowly until the arterial blood is seen escaping from the needle; now attach the syringe, securing it with a thread, and pump the fluid directly into the artery. The small size of the needle and the resistance of the arterial current will prevent the too rapid introduction of the fluid. The quantity required varies with circumstances, and may be one or more pints, according to the judgment of the operator. The water should be recently boiled, and everything aseptic.

If the advantages of this method should be verified by further experience, it should prove the ideal clysis. The fluid will certainly reach the heart, which it will invigorate and stimulate by its presence and high temperature, and be forwarded into the veins, there to liquify the thickened and stagnating blood and send it forward on its physiological mission. It is true that it may again be drained away through the intestinal leaks, but time will have been gained, and by freer supply to the embarrassed nervous system the intestinal vessels may have recovered their tonicity. It is not to be claimed that any method of clysis, or indeed, any other treatment, will cure all cases of cholera, but it is safe to say that many cases will be surely lost unless the circulability of the blood is restored.

CHOLERA AND QUARANTINE.

By S. D. Brooks, M. D., Cleveland,
P. A. Surgeon U. S. Marine Hospital Service, Cleveland, Ohio.

You all remember clearly the attempts made at the last session of Congress, early in this year, to provide the nation with better protection against the incoming of cholera; further, that the measures approved by the majority of the medical profession were defeated, and a quarantine bill substituted which met with little favor at the hands of the medical press — in fact, it was generally considered as no gain to the country.

But let us see if it has not been possible to turn it to advantage: 1. All vessels from foreign ports are subject to penalty if they enter a United States port unprovided with the new and strict bill of health. 2. The Supervising Surgeon-General of the Marine Hospital Service has examined all the local quarantine regulations in force at all United States ports; he has convened the local quarantine officers of all Atlantic ports, and with their co-operation and hearty approval has framed and sent forth a series of regulations which must henceforth be followed at all our ports. The country at large has made at least this gain, that the work of local, *i. e.*, State or municipal, coast or border quarantines, is to be always subject to uniform rules, and any deviation in the way of relaxing the national regulations will not be permitted. And after careful consideration you would, I think, all agree with me that the national regulations are strict. 3. The President has detailed twelve medical officers to serve in connection with United States Consuls at foreign ports, viz., one each at Hamburg,

Bremen, Rotterdam, Antwerp, Havre, Southampton, Liverpool, Marseilles, Genoa, Naples, and two at Quebec. Their duties are to make such inspections of vessel, crew, provisions, water supply, cargo and passengers as are demanded by the bill of health and the national quarantine regulations already referred to. And to show you that this work is being carefully done, a few lines from some of the reports will be most convincing. The surgeon on duty at Antwerp writes: "The following summary of the work done to the steamship Illinois is transmitted as an illustration of the program carried out for each of the passenger boats leaving this port for the United States. As each compartment was discharged, it was mechanically cleansed, and then disinfected with sulphur. This is done as a precautionary measure by the company. If, for any reason, the ship is considered infected, the disinfection is done by steam, under my supervision, as in the case of the steamship Noordland recently. The steerages are freshly white-washed every trip. The closets are flushed and disinfected. The ship was inspected and found to have insufficient ventilation. New ventilators were built into the lower steerages, to comply with the requirements of the law. The crew was examined physically by the superintending surgeon of the line. Each man is stripped. If passed, he is vaccinated. The crew was again examined by myself at boat muster, which took place shortly before embarkation. The bedding and luggage of the crew, in all twenty-nine bags, were disinfected with steam. The passengers from infected localities were held five days under observation. They were all vaccinated on the first day of detention, and were visited daily by a physician. The remaining passengers are vaccinated by the ship's surgeon on the voyage. I made the rounds of the immigrant hotels three times during the week with the superintending surgeon of the line. The baggage from infected localities, in all, ninety-seven pieces, was unpacked, spread out, and steamed for an hour. The baggage from non-infected localities was

then inspected, and thirteen bags containing dirty linen, and looking in an unsanitary condition, were also disinfected by steam. The fact that the steamship company has sent out circulars to its agents requiring all linen to be washed before packing, adds much to the battle against infection. The emigrants, 704 in all, passed the usual inspection. There were fifty-eight from Russia, fifteen from Galicia, and one hundred and ninety-seven from Hungary. A family of eight were detained on account of varicella. There were no cabin passengers. The manifest of cargo was examined before the ship sailed. The cargo contained some wood-pulp, cow hair, and rabbit skins, which were accompanied by consular certificates of origin and disinfection."

Again, a few words from the officer at Naples: "Every ship," he writes, "is inspected twice—a preliminary inspection to determine her fitness to carry passengers and the changes necessary to be made in ventilation and fixtures, and a final inspection as to cleanliness, and to see that orders requiring changes have been carried out. * * * There has already been a most noticeable improvement in the sanitary condition of both passengers and vessels; and I have succeeded in having running water put into latrines, lavatories supplied, and other reforms made in ships which have for years been carrying emigrants without these apparently indispensable conveniences."

From Liverpool we hear that "each emigrant is inspected by three physicians, one of the medical officers of the Board of Trade, the ship's surgeon, and the U. S. Medical Inspector. The inspection of the passengers of each ship requires about four hours." At Havre, "the emigrants are admitted by twenties into a large room, where they are vaccinated and given inspection cards. Each emigrant passes before city quarantine doctor, chief of steamship medical service, sanitary inspector, commissioner of emigration, two ship surgeons, second officer of ship, and the U. S. Inspector. I doubt if any inspection,

short of stripping each emigrant of clothes, could be more thorough."

At the time of the annual conference of health officers of the various states at New York, a request was made that an officer proceed to Europe to ascertain definitely to what extent cholera was present this Summer. Surgeon Wheeler, who had had large experience in inspection of immigrants at Ellis Island, New York, was detailed for this purpose. He is at present in Europe, and has already forwarded several reports as to the condition of the different countries, and in regard to the efficacy of the emigrant inspections at ports of departure for the United States. He writes from Hamburg—"there is no cholera here at the present time, and I feel sure that, as time progresses and the work of inspecting emigrants and baggage becomes more perfected, the danger from that source will be reduced to a minimum."

As the case stands at present, then, emigrants are admitted to this country from all ports of Europe. If they are from a province in which a case of cholera has occurred recently, all their baggage and the clothes they are wearing are steamed, and each individual has a bath. If they are from a non-infected locality, the baggage is inspected, and if foul is steamed or exposed to sulphur fumes. Each person receives an inspection ticket, and each piece of baggage is tagged to afford all possible information to authorities in this country. All old upholstered furniture, feather beds, down quilts and old clothing, other than the immediate wearing apparel of the owner, coming from an infected locality, are forbidden to be shipped. Rags gathered in an infected region are also forbidden.

Since such an unusually large part of the immigration this year has been coming via Canada, two officers are on duty at Quebec to inspect, and to certify by cards and labels, the condition of immigrants and baggage, and just what was done by Canadian authorities.

Concerning the Canadian Quarantine plant, Past Assistant Surgeon Banks writes, recently, "comment upon

such an elaborate plant as that above described must be of a favorable nature, and congratulations can be extended to the government which has equipped it. Although much remains to be done to complete the plans of Dr. Montizambert, yet the work is so far advanced that it can be clearly seen what the completed plan will be before another month ends." The baggage of all immigrants is steamed at Quebec.

You have thus a survey of what the quarantine law of 1893 has added to the National defense. The coast quarantines have, of course, all along the line been strengthened since last year. But the danger is still great. Is what has been thus accomplished enough, and will it ever be enough, until the whole quarantine establishment is made national and subject to one controlling head? The question is still to be debated, and discussions will arise the coming Winter in Washington. Will not the medical profession make its opinions felt among our National legislators? Will not the Ohio State Medical Society put itself on record at this annual meeting? Shall there be one system of quarantines for the country? Shall the present national system be extended to include all ports? These are the issues at present. I ask for your verdict.

DISCUSSION.

DR. C. G. COMEGYS.

Cholera has caused great destruction of life; that its attacks are due to a specific microbe is now, I think, a closed question. The profuse discharge of the blood serum, by vomiting and purging, is the cause of death. This violence can be explained, I think, by the stasis of the circulation of the blood in the mucous capillaries of the alimentary canal, and the transudation of the serous elements of the blood. At first the discharges contain, in a marked degree, the salts of sodium; at a later period the potash salts, which indicates that the red corpuscles also are losing their watery element. This pathological state is superinduced, as I believe, by the paresis of the neuro-

muscular system of the vascular apparatus of the stomach and bowels, caused by the excreta of the bacteria. We know how quickly the poison of a venomous snake produces swelling of the bitten limb; the paralysis of the extreme vessels of the member causes a great, prompt transudation of the serum of the blood.

The circulation of the blood through the terminal arteries, capillaries and corresponding venous radicals depends upon the normal tone of the muscular or circular fibers of these vessels; this tonicity is under the influence of the sympathetic nervous system. Given the normal *vis a tergo* of the heart and arteries, the *vis a fronte* in the capillary area, the normal tone in the venules, and the blood flows through these areas in its normal quantity and momentary manner; but anything that embarrasses the exit of the blood from the capillary region leads to hyperemia and transudation of serum. The poison in cholera produces flaccidity in the arterioles and venules; thence follows, first, overfilling of the capillaries; second, the flaccid venules do not carry forward the blood from the capillary area; hence the dangerous transudation.

If we be called to treat these cases before the algid period appears, give a hypodermic injection of half a grain of morphia, which will stop, promptly, the vomiting and purging, and next give twenty grains of calomel, with some soda, as soon as the vomiting ceases (fifteen to twenty minutes) after the subcutaneous injection; if the calomel be withheld, the vomiting and purging will return often with a fatal effect. The mercury is antiseptic, hence its great value, and it is also a hydrogogue, inducing a reflow of bile, which it is very important to obtain. Water and milk can be freely given after the good effects of the morphia are seen; thus the water in the blood is restored. It is very important to place the patient in a bath 103–4° for say ten minutes, to be unwiped and wrapped in a dry warmed blanket when taken out.

In the collapsed state use a hypodermic of morphia, one-third to one-half; give the calomel as before and the bath. Cantani *enteroclysis* should be tried; that is, a quart of warm water, slightly salined, should be passed into the colon by means of a fountain, or Davidson, syringe, and repeated every twenty minutes. Cool water and milk should be freely given, or a free use of *bouillon* may be made; this prepared by taking a chopped pound of lean meat, free from fat; soak in a quart of cold water one hour; simmer

it for another hour and strain; let it cool and skim off the grease, season with a little salt, and drink it by the wineglassful every half hour.

DR. W. J. SCOTT.

Dr. Comegys and I have met this condition in the same epidemic, although not together. I agree with Dr. Comegys in the management of the condition. The early treatment is the important element in the prevention of bad symptoms afterward. When these epidemics have prevailed in this country, we have always a great number of cholera specifics in the market, all containing almost the same things, in different proportions. They all contain opium. I agree with the doctor, not as to the quantity of his doses, but as to the quality of his doses. After I control the vomiting, I give small doses of calomel, upon the theory that preparations of mercury are the nearest specific remedies for the destruction of these microbes. And, if the presence of the microbe produces the poison, or destructive agent, if you destroy the microbe you will stop the agent. So far as the Government is concerned in the management of the prevention of the epidemics in this country, I think our Government is ahead of all the governments on the face of the earth in the relation it has taken concerning this epidemic disease. Our Government, in former times, inaugurated proceedings, from which almost all the governments of Europe have taken a cue, to have our men and agents in foreign countries for the purpose of sending home reports concerning the health of various nations. For our Government now to have these men in Europe, making the absolutely accurate observations made there, to prescribe and have carried out according to our law, in foreign countries, the disinfections which must be taken there before their people would be landed in our country, is one long step toward the prevention of infectious diseases. Has anything of this sort been done before? Not to my knowledge. Then these passengers are inspected on arrival in this country, to see if anything has occurred during the transmission of the subject from the port he came from to this country. The ship must be cleansed and fumigated, and the passengers must be cleansed. This is a long step in the right direction. Why not continue it? There is another point in this connection, which seems to

me important. The government of the United States should have educated men, qualified gentlemen, to take charge of this business, and the whole affair should be under the control of a medical department, under the Government, so that State organizations for the protection of the interior should not have an existence. The Government itself should be responsible for this part of the quarantine service. As it is, this service is in the hands of State and city organizations, which are very likely to be controlled by partisan influence, and which are apt to employ persons who are not competent. This service is likely to be leaky, because they do not know what they are doing. I think, now and for the future, the best interests of the people of this country will be attained if the Government, with the best class of men, have the whole charge of the quarantine service. I do not say the quarantine service is not now perfect as it can be, and that the quarantine service of New York is not perfect as it can be; but, is it likely to be perfect where the people employed are changed every year or two by political influence? Do you not see at once, there would be a probability of people being employed who are not competent, who are imperfectly educated, and imperfectly instructed as to what ought to be done? I think there is no doubt about that, and, therefore, I think it would be a good thing for this Society to-day to put our mark down as advocating the quarantine service by the general Government instead of by the States, as is done now in some important localities.

As to the foreign service. Any gentleman in this house can obtain a report from the Secretary of the Marine Hospital Service once a week, if he desires. By reading the official reports of our Government from all foreign countries once a week, you will become informed concerning these subjects as you have never before. It does seem to me, the distribution of that little tract from this office would be of great service in the promulgation of intelligent information among the members of the profession of this nation. The report contains the rules and regulations of the service, and the official reports from these foreign agents.

DR. BALDWIN:

In the epidemic of 1873, Dr. Fullerton, of Columbus, was called on to treat a number of cases of cholera. He

treated them with quinine; and without a death, while other physicians were losing about fifty per cent. He reported on this matter in three papers before our local society, and these were published in the *New York Record.* He spent some time in looking up cases in which quinine was used, and the results stated in this paper are certainly surprising. We will admit the disease is due to the invasion of a microbe, or the toxines produced by microbes. As is well-known, it requires a pretty strong solution of any ordinary disinfectant to kill microbes. It takes a strong solution of bichloride of mercury, for instance, to destroy the cholera microbes, but it requires a very weak solution of quinine to absolutely kill them, as demonstrated by laboratory experiments. Dr. Fullerton found that a very small dose, taken *internally*, not *hypodermically*, would produce the desired results. Thirty or forty grains thus given in small and frequently-repeated doses is all that is necessary. After a few doses the vomiting ceases, the solution is then carried through the alimentary canal, and the disease is cured.

My experience in this disease is nil, but if I am called upon to treat it I shall try this remedy thoroughly. The mortality is fifty per cent with all other kinds of treatment, and if quinine will reduce this rate, it is the proper remedy.

DR. HERRICK.

My friend, Dr. Comegys, has given his theory of the nature of the disease—a paresis of the nerves. Is that comprehensive? Microbes are regarded the efficient cause. Can you introduce into the alimentary canal any agent which will produce the discharges we have in cholera? Now, is it reasonable to suppose that you can get the peculiar discharge from anything but cholera germs? The nerves are mentioned as media. How could microbes act on the ganglionic nerves to produce the discharges? How do you get water serum from the blood? It is a transudation. This is caused by blocking the venous circulation. Now, suppose you recognize this microbe passing into the circulation; through the veins it must pass directly to the liver, and there, blocking the portal circulation, haven't you the condition for the transudation of the serous fluid? Then regarding the treatment: The diarrhea and vomiting are not the disease, but the results. Treatment by calomel is rational, as also by quinine. On the rational use of these

I have no criticism. Calomel in small doses, combined with opium, if you please, until you have restored the biliary secretion, will arrest the discharges, and just as soon as the secretions are restored the cholera is under your control. Is it not possible, now, that the microbes, which we recognize as being received from the water, pass through the portal vessel to the liver, on account of which there occurs an obstruction to the circulation, so that bile is not secreted, and you consequently have an entire suspension of the bile secretion, and the discharge of serum from the congested venous capillaries. Now, after having secured the action of the liver, you supplement this by quinine. I recognize this as sensible, reasonable, and founded upon a disturbed physiological function. Symptoms are expressions of diseased conditions, and, if possible, we should trace back the symptoms to some rational cause, some disturbance of the organs, or we are blind indeed.

DR. KERR, CANTON, CHINA.

I have had no very great experience with cholera, although it is very prevalent in China. I passed through one epidemic in this country before going to China, and there was one fact in connection with that very impressive to me, and that is it goes and comes; and it arises and stops often when you can not account for it. I was practicing in the upper part of Ohio in 1849. The cholera then entered by way of New Orleans, came up the Mississippi and Ohio to Maysville, and there branched off and up a road to the county seat of the county in which I was practicing. I was practicing in a town seven miles from where it stopped. I visited a number of patients there, who were taken with the disease, and of course it was supposed the disease would follow me up to the locality in which I was practicing, but not a case occurred north of this locality, where the two physicians died. And so with regard to quarantine, if we had undertaken to quarantine our town we would have thought we had stopped it, but it seems to me to stop of its own accord. So with regard to its progress in different counties. We know a great deal more about cholera than we did several years ago, but I do not think we know all about it yet. We have arrived at certain conclusions with regard to the cause and treatment of it, but we are in no wise certain that these will hold in

twenty years hence. We should, therefore, be on our guard and should be open to receive further information. In regard to quarantine, there is one point which leads me to doubt its efficiency. The measures adopted are complicated, and are not under the control of the physicians who have charge in any given locality, and there is danger some of those under direction will not be faithful, and not feel the necessity of keeping out the disease and obeying the commands that the gentlemen who give directions and have charge of the quarantine consider necessary. This is a danger we can not control. In this country a very stringent law has been passed to keep out 'John Chinaman,' but 'John Chinaman' comes all the same, although not in as large numbers, and this is because some officials connected with the Treasury think more of money than executing the laws of their country. Another thing I do not think we know altogether, is the different modes in which cholera is transmitted. I think we have something to learn with regard to that, and until we learn more I do not think we are prepared to lay down rules and regulations which will fully accomplish the object we have in view. One gentleman to-day said the use of steam was favorable to the good development of the microbe. The use of steam is required by law in cleansing the baggage of those who come as emigrants by ships. This is only an instance of the different views existing.

With regard to the treatment, we consider it as an accepted proposition that the microbe is the cause of the disease, and that it is received into the stomach, and the stomach alone. Now, if the disease is prevailing, and there are remedies and antiseptics which will destroy the microbe, we should make use of these antiseptics to destroy it. The point I wish to call your attention to is this: When the disease is prevailing, if there is any medicine which will kill the microbe, we must not wait until the disease gets control of the individual, but we should use this medicine continually if the disease is in the community. Where a physician has any influence, let him induce the people to make use, day by day, of such remedies as may have the power to destroy the microbe. I think the neglect of this is one reason why the disease will prevail and spread when it might be under control. Another thing, I would advise the use of small quantities of calomel, fractions of a grain, used more or less frequently by individuals who might be considered the cases subject to

an attack of this disease, in case it was prevailing. I would use this medicine to kill the microbe; that is, I would endeavor to keep the biliary secretion. Opium is recommended, but I doubt if it is valuable. However, it is recommended by some Indian physicians, and I think we should respect their decision, for I think our best information comes from the practice of physicians in India. Dr. McLean, for instance, who has written a book on tropical diseases, recommends the use of opium with certain antiseptic oils for restraining the diarrhea. In India his prescription has been found to be successful, and, if the oils contained in it are capable of killing the microbes, that explains why it is successful. When the collapse approaches, he recommends that the opium be not used, for if the patient is under the influence of it he is quite certain to die. I think it is important that we should be careful not to have the organs under the influence of opium when the collapse occurs. We should kill the microbes, and if there is any remedy which will destroy them and relieve the system of them we will save the patient. If this can not be done efficiently, there should be given continued and repeated doses, so the functions of the liver can be kept in operation. If the patient is exposed to an attack, he should be kept in the most favorable condition to pass through without going into collapse. I think these the most important points. I would advise you to consult Dr. McLean's works on this subject. He considers the use of warmth, applying blankets, as not advisable. He thinks it does no good. I had a case many years ago, in which a boy some ten or twelve years of age had an attack of cholera, and we worked with him and kept him warm. He was absolutely warm from head to foot when he died. I am satisfied in that case our efforts to keep him warm were without good result. Whether they were harmful or not I am not prepared to say. Actual rest and quiet are very beneficial. The use of ice drinks and ice water, and mucilaginous drinks when the patient is able to take food, will help to carry him through the crisis when he is about to pass over the stage of collapse.

EMPYEMA.

By Jos. Ransohoff, M. D., F. R. C. S., Cincinnati.

When our distinguished President did me the honor to request a paper on the important subject of empyema, it was understood that its treatment was the topic to be chiefly considered. To limit myself to this shall be my aim, but, to make sure of the object, a clear definition is essential. As an anatomical entity the term empyema, as applied to the chest, signifies an intra-pleural accumulation of pus. In the light of recent investigation, it must be regarded as a complication or sequel of one of a number of infectious diseases; for, like peritonitis, empyema may be said always to be secondary. Viewed as the result of a penetrating wound, the final lesion of a surface pneumonia, or the complication of a tubercular process, empyema presents varied clinical and prognostic phases, which have long been known to careful observers, but which it required the light of bacteriological research to distinguish as fairly distinct types of a disease.

In fully one-fourth of all cases, and in a larger proportion of children and the young, the onset is sudden, the general and local signs of a pneumonia fast follow one another, to give way to, or be marked by, an effusion into the pleura which, from its beginning, is purulent. In the pus removed the pneumococcus alone is found. As a pus-former, it is feeble and short lived, and a cure by absorption is even possible, though not probable. In whatever manner the pus be removed, re-accumulation is not probable. Therefore, is it that in this form of empyema, and particularly in children, a single aspiration is so often fol-

lowed by abiding relief, or that the simple incision, with proper precautions against wound contamination, ends in a cure in from two to four weeks. The chest wall is yielding, the lung tissue has lost none of its elasticity in the brief period of its compression, and everything conspires to a rapid return to the normal.

In another variety of empyema, the more virulent pyogenic organisms, the streptococcus and (to a less degree) the staphylococcus, are found. Often they are grafted on an intra-pleural effusion, which at first was serous or serofibrinous. Through long continuance of the effusion, costal and visceral pleural layers have become thickened, their lymphatics blocked, and absorption, of which a normal pleura is so capable, rendered impossible. In the absence of absorption, the presence of pus does not make itself manifest. Hence, it is that this variety of empyema is often latent, so far as general symptoms go. Even vast purulent accumulations may be made manifest only through dyspnea, cardiac displacement, scoliosis and œdema, all of which result from purely mechanical causes.

To discuss the paths of invasion of the pus-formers in these cases is beyond the scope of this paper and the ability of its author. Suffice it to say that it can not always be determined. It may be from the mouth or from the air-passages. In not a few cases it may be through the point of an unclean exploring or aspirating needle, with which, at the same time, saprophitic germs may be introduced. When, in these cases, an incision is made, the putridity they have introduced is shown by a rush from within of no inconsiderable volume of foul-smelling gases. Often the empyema follows in the wake of an acute infectious disease, such as typhoid, scarlatina, grippe, or osteo-myelitis. To this category of empyemas belong the cases in which the infection comes directly to a wound of the pleura, penetrating from without or from within. By way of digression, it may be remarked that the former are far more likely to be followed by empyema than are the latter. The

lung acts as a filter for the inspired air. A pneum-hæmothorax, induced by a subcutaneous fracture, is not often followed by an empyema. In penetrating wounds from without it is quite common.

Allusion has already been made to the barrier to absorption formed by the thickened pleura. The advantage gained in this regard is far outweighed by the hindrance it causes to the free action of the lung. Whether primarily or secondarily of the streptococcus variety, the empyema now under consideration, unless early submitted to surgical treatment, will assume all the characteristics of a chronic abscess, the walls of which thicken in proportion to its duration, while in the same ratio are diminished the probabilities of a *restitutio ad integrum.*

It is in this class of cases that the simpler operations of aspiration, or tapping, and the subsequent injection of fluids, are rarely of more than temporary benefit. To relieve life-threatening pressure effects, aspiration may be needed here as in the ordinary serous pleurisies. Simple but extensive incisions, with thorough irrigation and efficient drainage, will, in recent cases and young subjects generally, be followed by a cure, but in those of longer standing more extensive operations must be made before permanent occlusion of the abscess cavity is secured.

Whether or not the tubercle bacillus is capable of engendering suppuration, it is certain that the empyemas of adults are, in about one-fourth of all cases, associated with pulmonary tuberculosis. The simple serous effusions of tubercular origin may become purulent or the contents may be purulent from the very beginning. In the large proportion of cases the pus does not contain the bacillus of tuberculosis, but the true pus-formers which have invaded the pleural lymph sac, from some septic pulmonary cavity without a true perforation. The cases in which an empyema results from a rupture of a vomica are relative rare. They are readily recognized, for with the empyema there is almost of necessity

associated a pneumo-thorax. Practically, this condition may be said never to exist, except in advanced cases of pulmonary tuberculosis, and in which operative interference must be limited to measures of relief. Extensive operations, which aim to accomplish more than this are nearly always speedily fatal.

I have ventured to make the preceding considerations both clinical and bacteriological, for in recent cases of empyema the therapy must largely be determined by them. Since there are but few of us so placed as to render the bacteriological investigation of every case possible, probably the clinical data at present merit the more attention, and on their guidance alone we may confidently rely in the selection of a measure suited to each case. Were the formulation of rules of practice permitted, they might read thus: 1. Aspiration limited to one or two trials, for empyemas of the meta-pneumonic type, as seen in children and adolescents. 2. For all other cases, free incision and drainage. 3. Never let an empyema grow old.

Concerning aspiration, nothing new has been evolved. Bulon has substituted for it a continuous syphonage. It consists in the introduction of a drainage-tube through the canula used for tapping. The outer end of the tube is continuously immersed in an antiseptic fluid contained in a vessel which is at the patient's bedside during the night, and carried about during the day. Austrian writers, notably Immerman, speak very favorably of it. In the hands of the German and French it has not proven so satisfactory.

When incision is indicated, how and where shall it be made? Always under the strictest asepsis. Acting on the belief that the presence of pus within the chest makes ordinary precaution superfluous, may be fatal. The severest phlegmon of the chest wall, back and abdomen I have ever seen, followed a pleurotomy carelessly made. Fortunately, the patient recovered. Want of precaution may graft, in the simpler form of empyema, infection from

the common pus-formers. For anatomical reasons, the incision should be made with its center in the auxiliary line, and not lower than the fifth or sixth intercostal spaces. When it is made nearer the spine, the interspace is smaller, the danger of hemorrhage from the lower branch of the intercostal greater, and difficulties of preventing suppuration in the inter-muscular septa enhanced. When it is made below the space indicated, the ascent of the diaphragm by occluding the opening made, may seriously interfere with drainage. Whether or not a piece of the rib is to be removed depends on the width of the interspace. It has been an almost routine practice with me, even in children, to remove, with bone gouge forceps, for an inch or two, all but a narrow bridge of the rib below the incision. It permits an inspection of the cavity, mopping out with gauze, and insures ample room for drainage. Küster, in every case, makes a counter opening and institutes through-drainage. The necessity for this procedure does not seem to have impressed itself on the profession generally. With the free opening at one place, efficient drainage and an expanding lung, the discharges will be voided as rapidly as formed.

Shall the cavity be irrigated, is a question of no little importance. It is not without danger. Death from collapse, or, at least, most alarming symptoms, do follow its use when least expected. Therefore, its use should be restricted to the streptococcus and putrid forms, and to such cases in which flakes and shreds of lymph can be removed in no other way. Repeated flushing is called for only where there is putressence. The frequent use of irrigation must be harmful to the extent that it severs the surfaces already agglutinated and protracts the process of healing.

To secure drainage is a problem often difficult to solve. No greater error exists among the profession at large than that a tube in the chest cavity suffices. How often do we see that, although a long tube and one of ample caliber

has been used, accumulation, nevertheless, takes place between the dressings. The drainage-tube simply does not drain. In very recent empyemas, I have seen most violent fits of coughing follow the use of the long tube, from irritation of the pleura. If tubular drainage is at all needed, the short tube that just passes beyond the costal pleura answers quite as well. The syphonage of the pus, as fast as formed into a bichloride solution, I have resorted to twice. In the case of a child, the restlessness of the patient made it altogether impracticable. The second case was one of chronic tubercular empyema, in which death resulted twenty-one days after the operation, with many of the symptoms of mercurial poisoning. In thoractomy, as elsewhere, it is probable that the drainage-tube must yield its place to gauze packing. Capillary drainage, such as only gauze can bring about, is, after all, the most efficient. It has two signal advantages. First, to use it, an ample incision must be made; and second, when extensively introduced into the pleural cavity, it stimulates the formation of granulations which are so essential to the obliteration of the pleural sac. In tubercular empyema, iodoform gauze might be used. Although Schede lost a case, after extensive rib excision, from iodoform poisoning, the method appears to me to be fruitful of good results.

To pleurotomy and drainage the objection has been made that they entail and maintain a pneumo-thorax, which *per se* prevents the expansion of the lung. To obviate the ill effects of the pneumo-thorax a number of complicated drainage-tubes have been introduced, which, through mechanical means, permit the escape of discharges and prevent the entrance of air. Such contrivances are superfluous. Through a well-applied bandage, consisting of many thicknesses of gauze, aspiration of air does not take place. The air which gains entrance at the time of operation, if not replenished, speedily is absorbed. A pneumo-thorax, which results from the subcutaneous fracture of a rib, not infrequently disappears within two or

three days. It is true, however, that in great thickening of the pleura, such as is seen in old standing cases of empyema, the absorbing power of the pleura in this direction is lost.

From what has been stated, it is evident, in my judgment, that simple pleurotomy, with or without resection of a portion of a rib, will, in most cases of empyema, speedily effect an abiding cure.

There are some cases, however, which, notwithstanding this treatment, or in consequence of neglect, become chronic. They form a class of cases which tax the best judgment and ability of surgeons and of medical men. Operation after operation may be made, yet a thoracic fistula remains, and within the chest cavity a pus-forming sac with rigid walls prevents for months, and sometimes for years, the return to perfect health. The difficulty in the way of obtaining relief in these cases is considered by all to be due to two causes. First, the inability of the lung to expand, in consequence of great thickening of the pleura, and because of firm, inelastic bands of adhesion, which bind the lung down to the costo-vertebral gutter. Second, the inability of the chest wall to collapse to an extent sufficient to permit it to meet the bound-down lung. So far as possible, nature attempts to accomplish this. In old-standing cases of thoracic fistula the diaphragm will always be found above its normal level in the thorax, and the ribs will be found touching or overlapping each other, the intercostal spaces being completely obliterated thereby. A lateral curvature of the spine is one of the common evidences of this condition. If a cure is to be achieved by operative means, it must be in the direction indicated by the efforts of nature. Since the lung can not be made to expand, all operative measures must be restricted to the thoracic wall. The object of all operations for chronic empyema is to deprive it of its rigidity to a degree sufficient to let it come in contact with the retracted lung. For this purpose, multiple incisions of the ribs have long been

performed, but it remained for Estlander to popularize the method.

As is well-known, the operation of Estlander consists in the removal of from two to four or more inches of five or six ribs, the excisions being made subcutaneously. Estlander makes the incisions in the intercostal spaces in the axillary line, and through these incisions removes portions of two contiguous ribs. The excision of the highest rib entails a loss of a little more than one inch, whereas, that of the lowest rib, one of four or five, or even six, inches. In this manner a triangular section is removed from the thoracic wall, and the soft parts thereby permitted to sink to the level of the pulmonary surface. The lowest portion of the wound alone is utilized for drainage. Altogether, the results from Estlander's operation have not been as satisfactory as at first hoped. Fistulæ have remained frequently, and notwithstanding most extensive excisions, the thoracic wall has failed to sink to the required depth. It is probable that Schede, of Hamburg, found the cause of the failure in the very-much-thickened costal pleura and endo-thoracic fascia, which prevent, through their rigidity, the obliteration of the intra-thoracic cavity. For this reason, since 1887, Schede not only excises as many ribs, from their vertebral angle to their anterior insertion, as may be necessary, but removes, at the same time, all the underlying soft parts, leaving only the skin with the subcutaneous cellular tissue and muscles to be directly applied to the pulmonary surface. The incision whereby this is accomplished is a long U-shaped one, beginning above and behind, near the scapula, and terminating in front, near the sternum. Although the operation is an exceedingly extensive one, the mortality need not be excessively large, since, in cases where shock would not be well borne, the operation can be made at different times, two or three ribs being removed at one sitting. In the Schede operation a cutaneous flap is sometimes insufficient to completely close in the defect, a difficulty which can be readily overcome by the gauze packing.

Quite recently Quenu, in France, and Wagner, in Germany, have made what might be termed a multiple costotomy, whereby five or six ribs, are divided near the vertebral angle behind, and the cartilages in front. In this manner, it is claimed, the intervening portion of the chest wall is permitted to bring about the effacement of the abscess cavity. To what extent a very-much-thickened pleura may frustrate the object of the operation experience alone can reveal. The cases treated by this method are too few to warrant a dictum as to its value.

In tubercular cases that are far advanced, and that are associated with pneumo-thorax, it is probable that such extensive interference will do little more than hasten death. In these cases, and in those in which there is a bi-lateral empyema, such extensive operations are unjustifiable. Our efforts must be limited to giving such relief as can be obtained by aspiration.

In conclusion, I beg to state that I have intentionally refrained from presenting cases from hospital or private practice, hoping thus, in the briefest manner possible, to bring before you for consideration and discussion, the broad principles in the management of a disease alike interesting to surgeons and practitioners.

SOME POINTS IN THE DIAGNOSIS OF CHEST EFFUSIONS.

By S. F. Forbes, M. D., Toledo.

The frequent and humiliating blunders in the diagnosis of chest effusions must be my apology, if one is needed, for claiming your attention for a brief space to a matter somewhat hackneyed of late.

Notwithstanding the frequency with which the profession has to deal with these troubles of the chest, errors in diagnosis are constantly occurring, subjecting the attendant to mortification and the patient to unnecessary trouble and danger. Only last year three leading physicians of a neighboring city were industriously working upon the left chest of a patient with blisters and other means, for several weeks, to remove a supposed chest effusion, without success. As a last resort, aspiration was resolved upon; but a consultation was requested by the friends, and I was invited to see the patient. I found the *right* chest full of fluid, and aspiration was done on that side the next day, and forty-four ounces of serum drawn from this chest, the left side being entirely normal. About the same time I was called in consultation, or for operation rather, by two leading physicians of my own city for a supposed chest effusion in a young lady. There was no effusion whatever. The patient, on the contrary, was suffering from lung disease. The operation was deferred, and the patient died last Spring from phthisis pulmonalis.

Some years ago not more than three out of at least twenty-five physicians made a correct diagnosis of a chest trouble in my own person. A case of so-called "dry

tapping" took place last Winter in the person of a nephew of mine, resident of a southern city, through error in diagnosis of three leading physicians of that locality. The young man was suffering from lung trouble, and there was no effusion whatever in either pleural sac.

These instances of error in the diagnosis of chest troubles could be multiplied without number. Indeed, it is a lamentable fact, that even in our day, with all the knowledge which the profession possesses on this subject, these errors are constantly occurring; not among our rural brethren only, but also in the centers of general and medical intelligence. And it is more with the view of bringing this matter sharply to your notice, and grouping briefly and curtly a few diagnostic points, than from any idea of furnishing anything new or original, that this paper is presented.

Chest effusions which follow or attend inflammatory processes, are accompanied with a group of symptoms not present in that trouble known as hydrothorax. And these symptoms aid not a little in coming to a correct diagnosis. For example, in effusions from pleuritic inflammations, there will be cough, fever, increased pulse and temperature, pain, increased respiration, especially after exertions; loss of appetite and strength, and emaciation, followed in due time by the peculiar physical signs characteristic of effusion, and the absence of the signs and symptoms of pneumonic and other lung troubles. These physical signs, as they are denominated, are as nearly pathognomonic as any we find diagnostic of any complaint. For while there is dullness in many affections of the organs of the chest, there is no *such* dullness as is found when a pleural sac is well filled with fluid. Absence of respiratory murmur to a greater or less extent (in some cases, indeed, it is entirely wanting), and dullness on percussion, are the two most relable signs or symptoms of chest effusion. True, as above stated, these signs are present in other troubles of the chest organs; but care and patience in examining the

chest, and a due estimate of other symptoms which attend the various troubles of the lungs, will enable the physician to correctly differentiate between the conditions which produce these signs. For example, in the faulty, perverted, and imperfect respiratory murmur which attends inflammatory conditions of the lungs, the cough, pain and sputa are widely different from these symptoms when they are attendant upon chest effusions. Again, the dullness present in effusions is a more absolute dullness than exists in any other condition. Furthermore, it always begins in the lower portion of the chest cavity, and slowly advancing upward, observes, up to a certain point at least, the laws of gravitation in the different positions of the chest. The exception intimated is where the effusion is saculated, or where a pleural sac is absolutely filled, and the heart is driven entirely out of it into the opposite pleural cavity. The gradual enlargement of the affected side is, perhaps, next in importance as a diagnostic sign. When considerable time has elapsed, and the effusion becomes extensive, the affected side is often two to three inches larger than the healthy one — a condition that is never found in pneumonic or other troubles of the lungs; at least in only a very slight degree, if at all. The bulging of the intercostal spaces, spoken of by some authors, I have not noticed, with a possible exception in the case of a feeble and greatly-emaciated child. I am confident this is rarely seen in well-marked cases of effusion; and for the reason, that as the fluid goes on increasing, the ribs are carried apart, and all the intercostal structures are rendered tense and inelastic. So, also, of succussion or sloshing. This phenomenon is never heard or felt, I believe, except when the fluid is subsiding, either through absorption, or from an operative procedure.

The difficulty of breathing and cough, which are so invariably present in chest effusion, should be grouped with the other physical signs in these cases, as they are so entirely the result of the mechanical conditions. All persons

suffering from any considerable chest effusion are unable to make moderately rapid exertions, such as ascending stairs, etc., without experiencing greatly increased breathing, usually attended by a paroxysm of cough.

In cases of organic disease of the heart, liver, or kidneys, as well as in hydrothorax, it is often highly essential to diagnose a chest effusion, the better to put in force such measures as may relieve, and, in the last-mentioned trouble, possibly bring about a complete cure. In these cases the effusion is almost always double-sided, and the history of the case and the condition of the patient afford great aids in the diagnosis.

If, after a full examination and review of all the symptoms in the case, both clinical, general and physical, the physician is still undecided, then, before resorting to the somewhat pretentious operation of aspiration, we have in the hypodermic syringe an agent of absolute certainty; but not through the ordinary hypodermic needle, which is sometimes too short, always too small in the diameter of its tube for purulent effusions to pass through, and which, in one instance, at least, I saw bent and rendered useless in an attempt to introduce it into a pleural sac. To obviate these objections, I had made a long, strong needle, which adjusts on the ordinary syringe, and which can readily be obtained from any instrument maker. This little instrument will frighten neither patient nor friends, and can be used upon the plea that perhaps the fluid may be sacculated, and more than one puncture may have to be made. Having obtained fluid, the needle may give place to a large aspirating needle, or the sucker may be adjusted to it without removal. In a failure to obtain fluid, the embarrassment of the operator and the disappointment of the patient and friends will not be as great as when the more formidable aspirating apparatus is used. This needle I have found a most useful exploring needle for many purposes in general surgery.

A simple recapitulation, and I have done, to-wit: In all cases of suspected chest effusion, a most careful considera-

tion of the general symptoms and clinical history of the case should be had. I saw one case of chest effusion made out by exclusion, mainly. The physical signs being very ambiguous and unsatisfactory, the surgeon reasoned that from the general symptoms, as the patient could not have anything else, he must have that. Aspiration proved the correctness of the reasoning.

Next in order comes the loss of respiratory murmur, beginning in the bottom of the pleural sac, and extending slowly upward, where tubular breathing is the only sound heard when the sac is well filled. Dullness, of an intensity not heard in any other condition of the chest, and a slowly-increasing roundness and enlargement of the affected side, with an abnormally-increased respiration after slight exertion, followed, usually, by a paroxysm of coughing, and the picture is complete. The absolute verification of the conditions, however, by the hypodermic syringe, if needed, should be had in all cases of doubt.

In the beginning of this paper it was announced that nothing new or original would be given. Such announcement now would be superfluous; but if it shall in any degree aid in stimulating the profession to make better and more thorough use of known methods, blunders in the diagnosis of chest effusions will be lessened.

DIAGNOSIS OF EMPYEMA.

By Thos. M. Sabin, M. D., Warren.

The consensus of medical authority demands incision of the chest in empyema, and the withdrawal at the earliest possible date of the contained pus. With such positive and authoritative teaching on the subject, it would seem that the general practitioner's course in treating such cases was rather an easy one, the diagnosis having once been made; and so it would be, were it not for the fact that many diagnoses in these cases fail to diagnose, if we are to believe the humiliating story of the aspirator, told often, amid the most embarrassing surroundings of hemorrhage and dyspnea.

The classical physical signs of empyema comprise bulging of the intercostal spaces, displacement of apex of heart to side opposite to that of effusion, diminution of respiratory movements of the affected side, diminution or entire absence of vocal fremitus, vocal resonance diminished or absent, flatness or dullness over the affected side, absent or greatly diminished respiratory murmur, and rarely aegophony. These symptoms, with some modifications, existing for any length of time, together with the characteristic constitutional disturbance, constitute, we are told, imperative indications for surgical interference.

Suppose, now, that with due antiseptic precautions, we make the would-be confirmatory puncture or punctures with the aspirating needle, and fail to get fluid of any kind. Should we be content to consider this the final court of appeals, or should we, acting upon what would otherwise seem to be positive evidence of fluid, take our chances on a free incision?

That is, are the physical signs above mentioned worthy of sufficient confidence to offset the negative evidence of the aspirator? If we are to say that the aspirator must decide the question, then what other condition could be responsible for the physical signs, and what course should be pursued?

Having been myself placed under the very trying and embarrassing circumstances of aspirating in vain, in several cases where the physical signs seemed so demonstrative as to make aspiration, for diagnostic purposes, superfluous, I have been led to one of the two conclusions—either that I do not possess average diagnostic skill, or else the physical signs of empyemata are frequently misleading in the extreme. I am inclined to the latter view of the case, first, because it is much pleasanter to contemplate, and, second, because I have known of and seen several of my confreres making similar blunders.

The history of a case in point I recall with marked vividness. In the Fall of 1887 I was called to see a young man twenty-five years of age, of marked tubercular family history. He had been out of health for three months, but had continued his labor, that of peddling milk, up to the time at which I was called. I found what I considered to be conclusive evidence of an empyema, in the physical signs and the general history of the case. Not the least among these signs, was a fluctuating tumor over the lower ribs of the afflicted side, an incision into which was rewarded with an ounce and a half of pus. There was no further discharge from this point. This, of course, did not relieve him, and I then called in a diagnostician, in whose ability I had great confidence, with the idea that should he concur with my views, we would make a free incision, and establish drainage. After reviewing the history of the case and the physical signs, he was as confident of the presence of pus as I; but, in pursuance of his usual custom, he insisted on making use of the aspirator, to still further establish our diagnosis, which he did at two different points, with negative results.

We concluded to wait and see. We did wait; and in due time the fellow died. No post-mortem could be had. I still believe that he had pus in the pleural cavity, which should have been let out. Nothing but the probable tubercular origin of the trouble offered me any comfort in my management of the case.

Three years since, in a case suffering pyemia from a neglected appendicitis, the symptoms of pus in the right pleural cavity came on with the same definite signs. To be sure to give the patient the benefit of the best skill, we called to our assistance one of the brightest diagnosticians of Northern Ohio, who was kind enough to agree with me, and to do the aspirating. I had the morbid pleasure of watching the little window in the aspirating tube, held in a master's hand. A few bubbles, a few drops of blood—nothing more, except a gasping for breath, cough, and free expectoration of blood. For most obvious reasons, a second puncture was not made. A few hours, and all was quiet, with no harm done—except to our reputations as diagnosticians. At the end of two or three weeks there was some improvement. Some four months later I evacuated a quart of pus, at a point two and one-half inches above the umbilicus, and an inch to left of median line. Whether it came from the right pleural cavity or not I do not know. The patient is still living. The signs of an empyema have all subsided, leaving a lung but very little crippled.*

What possible condition can give enlargement of affected side—diminished respiratory movement, diminished or no vocal fremitis, flat or dull percussion note, diminished vocal resonance, diminished or absent respiratory murmur—but fluid in pleural cavity? Yet, I dare say, many of the gentlemen present, having based their diagnosis on these signs, have been disappointed in not being able to confirm it by the aspirator intelligently used.

*A post-mortem held on this case, October 10, 1893, demonstrated that the pus evacuated did come from pleural cavity, and was there when we aspirated for it.

I am satisfied that, from conditions found at post-mortem, it would be exceedingly easy for the needle to fail to tap the reservoir of fluid. We have all noted, in old pleural troubles, the excessive amount of adhesions, the festoons of tough, leathery lymph adherent to the parietal surface; the tough, thickened pleura, which is almost invariably present in these cases. It would seem, many times, a wonder that we get through into the fluid at all, especially with the hypodermic needle, which is advocated without question as the crucial test by many authors.

In the article on "Surgery of the Respiratory Organs," in the American Text-book of Surgery, in speaking of empyema, the author says: "This pleura is practically the wall of an immense abscess; and from it shreds of membrane and disorganized tissue may hang like stalactites from the roof of the cavern."

Prof. Meigs, in his discussion of empyema and the use of the aspirator, before his class at Pennsylvania Hospital, gives an experience in which he failed to strike the pus, because of an adhesion of the diaphragm to the ribs above. The post-mortem showed the mistake, with quantities of pus, which should have been evacuated.

My friend, Dr. Julian Harmon, of my own city, in relating some interesting cases which he had the pleasure of seeing, through the kindness of Prof. Kuester, of Berlin, spoke in particular of a case brought into the Professor's clinic, suffering from what was diagnosed as empyema. The greatest dyspnea and cyanosis existed. Not until the third effort with the aspirator was he rewarded with fluid, notwithstanding, when the cavity was opened with the knife, he was nearly deluged with pus, four feet away.

I do not wish to go on record as never confirming my diagnosis with the needle; but in my limited experience, I have several times had this fact forcibly brought to my observation, "That we often fail to strike the pus with the aspirator when it is there." What the general practitioner must have (speaking from down in my own heart),

is a better and more definite interpretation of physical signs — a better and more systematic method of examination, and then the courage of his convictions — courage to make a careful dissection for the pus, as is done in abdominal work, when the diagnosis is incomplete.

With so many possibilities for failure in the use of the aspirator, I am convinced that its importance as a diagnostic measure has been greatly exaggerated, and its negative story has too often stayed the hand of the surgeon when nothing but active measures could have possibly saved life.

THE RELATIVE MERITS OF ASPIRATION AND RESECTION IN CHRONIC EMPYEMA.

By J. C. Martin, M. D., Findlay.

The fearless, bold, yet cautious surgeon—fearless, because he has his anatomy at his fingers' ends; bold because he has the courage of his convictions, and cautious when there is the element of doubt—has come to stay, while the timid, vacillating, yet, perhaps, equally skillful, operator is fast being supplanted.

A few years since, operations that were considered too radical, and even dangerous, are now in the hands of the former operator, with the approved methods of antiseptic treatment, successful and of every-day occurrence, while the uncertain, timid operations are being relegated to the shades of Hypocrates; and to the latter class I would assign the operation of aspiration for chronic empyema, while the treatment of these cases by resection must take its place.

In dealing with a case of chronic empyema, what do we find? A patient, emaciated, pale, weak, with more or less cough, loss of appetite, and, perhaps, hectic fever and night sweats, all caused by an accumulation of pus in the pleural cavity, and surely demanding immediate relief. From long-continued pressure, the lung is probably bound down by adhesions. Fibrous bands across the cavity confine the pus in pockets. The pleura is converted into a pyogenic or pus-secreting membrane. Our duty in a case of this kind is plain; and that is to remove the offending material at once. Shall we aspirate, or shall we resect? I believe the latter procedure the proper and only one.

Nothing, comparatively speaking, can be gained by aspiration. The fluid is never entirely removed by one operation, and repeated aspirations only delay the case, and finally leave a nidus for the lighting up of a tuberculosis, or some intercurrent inflammation to kill the patient; or resection is resorted to when the patient has lost so much strength that the operation is a failure. Had the more radical operation been done in the beginning, the cavity, or cavities, could have been thoroughly emptied, the pus-secreting membrane scraped, all the debris removed, and, if a small cavity, packed with iodoform gauze, and good results follow. Of course, free drainage must be provided for at the most dependent portion of the cavity, and all done under strict antiseptic precautions. In deciding upon the amount, or length, of a rib, or the number of ribs to be removed, condition, depth, and shape of the cavity must be considered. This can be quite accurately determined by exploration with probe or finger. And let me say, right here, you will probably remove too little. You had better remove a portion of all the ribs lying over the cavity, than not enough. This is particularly true if you want the chest wall to fall in, and thus bring the walls of the abscess together. I do not know what the per cent of cures by aspiration is. I do know that successful cases are reported, while the unsuccessful ones are not often recorded.

A large proportion of the failures by aspiration are finally treated by resection or free incision, and the failure to cure is often charged to pleurotomy, and which was caused by the delay while aspiration was being tried. I doubt whether there was ever a recovery from chronic empyema in an adult without a free opening, either spontaneously or by operation. The results of the operations for chronic empyema by resection are exceedingly favorable, comparatively speaking. The pus must be removed and the pus cavity must be obliterated by the falling in of the chest wall. Can these objects be effected by aspiration? Surely not. The cutting away of two or more ribs allows

not only the emptying of the pus sac, and the treatment of the membrane itself, but what is equally important, the falling in of the chest wall and the closing of the cavity.

There are, probably, cases of empyema occurring in children with their elastic chest walls, if seen early, when the operation of resection would not be necessary. But in chronic cases the operation by aspiration is not to be depended upon, as we are giving the lung time to form adhesions which may prevent expansion, and that, finally, the best result we can possibly hope for is far from being perfect, and may leave the nidus for a future tuberculosis.

In chronic empyema there is always the thickened pleura; covered with pus-secreting granulations. Strings of fibrin and cheesy masses are more or less abundant. The former can not be properly treated after aspiration, and it is almost equally difficult to rid the cavity of the latter by aspiration. Fibrous bands sometimes divide the cavity into a number of sacs. These can not be emptied unless successively aspirated. Then there are no means of telling whether the above conditions are present or not; and this uncertainty should lead us to abandon an operation that can only delay the case, and thus subject our patient to unnecessary dangers, when we have in resection a method as free from danger, and which has all the elements of a correct, modern surgical procedure, *i. e.*, the thorough removal of the offending material—the pus—along with the fibrin and clots, and the proper treatment of the walls of the abscess, the falling in of the chest wall, and the agglutination of the lining of the cavity.

COMPLICATIONS IN EMPYEMA.

By Wm. Caldwell, M. D., Fremont.

In consenting to discuss the subject of empyema, under the subdivision of complications, I have necessarily limited myself to the consideration of but few conditions; as many of the so-called complications are but the logical results of diseased processes ordinarily found in the affection now under consideration. While this is true, however, to a certain extent, a practical experience with the disease will reveal to us certain conditions, or complications, which can not properly be ascribed to the original affection, but are due either to neglect of timely or proper treatment, or arise from conditions which existed prior to and stand in a causative relation to the empyema, and so determine a condition of things which I have heretofore been pleased to designate as secondary empyema; and I may here ask your indulgence while I follow for a moment a line of thought pursued in the paper read before the North-western Ohio Medical Society, at Lima, in December, 1892, in which I reported a somewhat remarkable case of secondary empyema, due to the bursting of an hepatic abscess into the pleural cavity.

By secondary empyema I desire to be understood as referring to those cases in which the pleural cavity, not necessarily previously diseased, is invaded by the contents of either a tuberculous cavity, abscess of the liver, or a perinephritic, or a perityphlitic abscess. A purulent inflammation may also be excited by septic material in the case of pneumothorax. Other conditions giving rise to this form of pleurisy may be cited, but these brief refer-

ences will give you a fair idea of what I mean by secondary empyema, in this connection.

The symptoms of this disease, when fully established, differ but little from the primary form of purulent pleurisy, though the suddenness of the onset might reasonably be expected to furnish very pronounced symptoms. Although we here have a large serous cavity, which is so unceremoniously invaded, yet it seems remarkably tolerant when compared with other serous cavities, especially the peritoneal. The intrusion seems to be but mildly resented at first; there is little shock, and the reaction is largely masked by the symptoms of the primary disease which has so suddenly been turned into a new channel.

If the primary disease has been overlooked, or its symptoms misinterpreted, the advent of the symptoms referred to the pleural cavity may occasion some confusion in determining the real nature of the affection; though a purulent pleurisy, due to such an accident, when fully established, presents a few signs or symptoms of itself, by which its origin could be reasonably inferred, except it may be in the case of a pulmonary abscess which had found such an outlet, when the added symptoms of pneumothorax might lead us to a correct conclusion as to its etiology.

The rational signs of an empyema thus established differ but little from the ordinary forms of purulent pleurisy. It may reasonably be presumed, however, that in the case of a perinephritic, perityphlitic, or hepatic abscess, in which the pus is formed, so to speak, in and about the tissues where it finally collects into what is called an abscess, the tissues forming its wall or capsule become more tolerant to the foreign matter than other tissues not habituated to its presence. So in the case of a primary serous pleurisy gradually undergoing a transformation into pus, or purulent from the beginning (the latter, however, being doubtful), the pleural cavity would be more tolerant of the presence of such a fluid of local

origin, and there would be less constitutional sympathy with such a condition, than there would be were the pleural cavity to be suddenly invaded by a mass of already putrid and poisonous pus, ready at once to set up in its new locality, under the most favorable conditions, a secondary inflammation, with tissues ready for the absorption of septic matter and the production of septicemia and all its concomitants.

In secondary empyema the contents of the pleural abscess are putrid from the beginning. A septic inflammation is at once set up, false membranes readily formed, and the demand for prompt surgical interference is imperative.

Secondary pleurisy may, also, be due to an extension of the inflammation from the lung, the pericardium or the peritoneum. It may also occur during the course of acute rheumatism, measles, scarlatina, or typhoid fever. It is known that it is often a sequel to renal disease, and probably tuberculosis.

As we have stated, it is possible that the exudation into the pleural cavity may be purulent from the beginning; but ordinarily it starts as a serous or sero-purulent fluid, and changes with greater or less rapidity, or insidiously, into pus. If not evacuated by an early operation, the fluid will remain a long time within the chest cavity, and then will seek an outlet either through an intercostal space, or may penetrate the lung, discharging through the bronchi; or it may perforate the diaphragm and escape into the peritoneal cavity, setting up a violent peritonitis; or, still further, through the advent of an adhesive inflammation, the fluid may fortunately be conducted to the intestinal canal.

From the not infrequent insidious character of this disease in small children, it may be well to emphasize the importance of always examining the chest of these little patients who present the slightest evidences of pulmonary disease, or where the subjective evidences may be entirely wanting, but especially where there is dyspena which is not otherwise accounted for.

It is well to bear in mind that empyema is often an accompaniment of acute pneumonia, and examination of the chest will often save us from future embarrassment.

In the beginning of this paper, I claimed that complications are, in many cases, directly traceable to faulty management, or a neglect of early operative procedures; some physicians having held to the opinion that the purulent exudation will, in some cases, be absorbed; and cases are cited in proof; but we are left in the dark as to the subsequent history of such patients. But Dr. Edebohls, in the *New York Medical Record*, of January 26, 1884, records the case of a child in which, after proof, by puncture with the hypodermic syringe, of the presence of a purulent fluid in the chest, and further operative proceedings being declined, that some months after, the child being examined, the chest was found to be free from fluid. One year after, however, manifest signs of tubercular disease were found to be present.

Spontaneous disappearance of such effusions can not, however, be reasonably looked for, and are certainly very uncommon, and must certainly be fraught with much danger.

It is to a partial absorption that we must attribute the symptoms of hectic, in the latter stages of suppurative pleurisy.

Admitting that the more liquid portions may be absorbed, the inspissated pus is left behind, which, upon softening or undergoing degenerative changes, invites the danger of remote pleural abscess or secondary tuberculosis.

ILLUSTRATIVE CASES.

First.— This was a case of hepatic abscess which perforated the diaphragm, causing secondary empyema, to which reference has been already made. This patient fully recovered after a prolonged illness.

Second.—A case which had been under the care of a homeopathic physician, and diagnosed as pneumonia, which was found to be an immense, extra-thoracic abscess, communicating with the pleural cavity. Free drainage was followed by rapid recovery.

Third.—A case of chronic empyema, caused by caries of ribs, due to the kick of a mule, in the army, in 1864. During the past two years, burrowing of pus had taken place, and an abscess within the pleural cavity had been established, which had gradually involved the pulmonary pleura, with resulting bronchial fistula, and consequent pneumothorax. This case was examined by the Fremont Board of United States Medical Examiners for Pensions, two years ago. The writer had, at that time, an opportunity for examining the patient, and eliciting the history of the injury in the army. At this time, there was a fistulous opening, leading down to the carious rib. I saw him subsequently, about six months before his death, which occurred a few weeks since, and made the diagnosis of empyema, and advised the removal of diseased ribs and free drainage, which was declined. It is the belief of the writer that if early operative procedures had been instituted in the case, that the patient's life might have been saved.

DISCUSSION.

DR. THORNE.

I want to add my voice as against the use of the aspirating needle in cases of thick fluids. It is of no use in the thicker fluids. It has been my experience on three separate occasions to use the aspirating needle without finding pus, whereas pus was found with the use of the knife. Recently, my son made an operation in which he cut for pus without finding it. Without hesitation he went above the rib, making a second cut, and was rewarded by an abundant flow. I at first did not find any pus in a case upon which I operated, but by going one or two ribs higher I found it. I am against the use of the aspirating needle, although it is very well when there is thin fluid.

DR. COLEMAN.

I wish to say a few words in reference to effusion in the pleural cavity. I believe that the majority of physicians here will agree with me, that there is hardly a six months goes by in which they are not called to see some cases where there has been a mistake in diagnosis. Why is this? In the first place, it is a neglect in the examinations. The examinations are not thorough, the patient in many cases not being divested of his clothing at all, the physician attempting to make the examination through coat and vest. Then, again, many examinations are made with two or three shirts on, instead of the patient being divested of all clothing. A patient was brought to me about three weeks ago from a neighboring city. He had great dyspnea, and could hardly get into my office. I had him lay down for a few moments, and then had him remove the clothing from his chest. I then looked him over, and found the apex of the heart between the third and fourth ribs on the right side. There was no motion on the left side. Right here, let me say, whenever you have effusion, you will have negative physical signs; that is, there will be none of the normal sounds, and the normal vesicular murmur, vocal resonance, etc., will be absent. I operated upon this case the next day, and removed nine pints of fluid from the left side of the chest. This was a case other physicians had seen, evidently without detecting the presence of fluid. I call your attention to this case as an instance of such errors. Next comes the interpretation of the signs. Many men depend on the symptoms, but with these alone you can not diagnose with any certainty an effusion in the cavity so absolutely that you would swear to it. A heart lesion might produce all the dyspnea you would find in effusion of the pleural cavity. If your signs are carefully interpreted you will make no mistake, for if there is any error, it rests in your interpretation, and, as has been said here, where you find extreme dullness and absence of all the normal vesicular sound, you may be pretty certain of your diagnosis. According to Flint, in nine out of ten cases, in which definite signs are wanting, there is an effusion in the pleural cavity. My experience will make the ratio even higher than this. Then, we must not rely too much on symptoms, but depend on signs in reference to effusions in the pleural cavity. There are some difficulties we have to encounter, and one has been mentioned by the gentle-

man on my left in reference to interstitial pneumonia. This I admit is one, and in my experience I have found an extremly-thickened pleura and subserous connective tissue producing the same effect as interstitial pneumonia. Where we have the pleura adherent the conditions are difficult to diffierentiate. In one case afterward operated, and revealing the pleura entirely adherent and greatly thickened, there was absence of all the normal signs usually revealed by percussion and auscultation on examination. There may be found other causes for error in diagnosis, but the two important ones are interstitial pneumonia, and the extremely-thickened pleura. My friend, Dr. Baldwin, who has had a good many cases of empyema, but a short time ago interrogated me in reference to my opinion why so many of these effusions were not properly diagnosed. I simply explained to him, as I have to you, that the great majority of them occur through neglect. These cases very often come to us with the statement that they have a pneumonia which will not clear up. Any gentleman not well versed in physical diagnosis, ought to be well enough versed in the symptoms of pneumonia to know there is something there out of the usual line.

DR. BALDWIN.

There is one point in regard to the diagnosis between empyema and hydrothorax, which has been of great interest, and which I am not able to explain. Several times I have made a diagnosis of pus from the physical signs, the history of the case, the symptoms, and because the temperature was constantly elevated; but upon operating I have found simply serum. A case of this kind was presented to our local society a short time ago. The patient was present, and on examination I thought there was pus in the pleural cavity. In that case about a year had elapsed since the initial symptoms, which were somewhat violent. Measurement showed some two inches difference between the right and left sides, but instead of being more prominent, the diseased side was sunken. I based my diagnosis on the fact that the temperature was 100° to 101°, and pulse 120, with emaciation and decline. The patient came afterward into my care, and a few days later I made an aspiration, removing about a pint of serum. This was accomplished with considerable effort. There was a vio-

lent coughing spell, and with it an apparent loosening of the bands of adhesion. There was no pus whatever, and the patient is reported as doing well.

I have been fortunate, or unfortunate, enough to see a good many cases of empyema, and many in which errors of diagnosis have been made. I saw two cases, in one day, of pus in the pleural cavity, which had been treated for some time as cases of pneumonia, which had failed to undergo resolution.

For the purpose of demonstration of the diagnosis, I usually use the aspirator, but I have found the aspirators as usually made valueless, and I have had made an aspirator-tube nearly the size of a pencil. The pus is never too thick to come through this tube. I never resort to aspiration with hope of cure in adults, but always make a free incision and remove a portion of a rib. However, Dr. Kinsman has reported one case of an adult in which a single aspiration effected a cure. This case occurred several years ago, and the result has verified his diagnosis and treatment.

As to the Estlander operation, I have removed, in one case, parts of six ribs. In that case there was a sinus, which had been discharging for several years. I curetted the lining through the free opening I had secured, and recovery was made with astonishing rapidity. We now have a case in the hospital of unusual interest. It is a case which I was called to see in an adjoining town. The area of dullness was limited, and examination with a small aspirator needle negative; but I was not satisfied, and had him sent to the hospital. My surgical colleague on duty at the hospital disagreed with me in my diagnosis; but in a few weeks another colleague came on duty, and an operation was then made and sections of four ribs removed. We found entire calcification of the lining of the pus cavity. This was dissected out with a great deal of care, and the man is now convalescent.

PENETRATING WOUNDS OF THE EYEBALL.

(PROGNOSIS AS INFLUENCED BY LOCATION AND NATURE OF INJURY.)

BY HARLAN P. ALLEN, M. D., COLUMBUS.

Nettleship says, "Every case of penetrating wound of the eyeball has to be judged from two points of view, the damage to the injured eye, and the risk to the sound one." The most sagacious observers are often in doubt as to the outcome, and anything that will even in part clear away the doubt is worthy of attention. Fortunately, we have not to take into account the preservation of life, as the danger of a fatal termination is practically nil.

We may appropriately make the following interrogations, the answers to which will probably determine the fate of both eyes:

First. — What part of the eyeball is involved in the wound?

Second.—Is the wound an incised or a lacerated one?

Third.—Is it aseptic or septic?

Fourth.—Is it simple or complicated?

Fifth.—If a foreign body is retained, what is its composition, what its position; is it loose or encapsulated?

Operative incisions will not be taken into account.

Penetrating wounds of the cornea without further damage to the eye, are rare. Such wounds heal rapidly with ordinary surgical precautions, as this tissue is quite tolerant of injury.

Simple wounds of the iris, in connection with penetration of the cornea, heal rapidly in the vast majority of cases. This is self-evident, when we consider how tolerant this tissue is of surgical interference, with modern aseptic

precautions. Uncleanliness of the penetrating substance increases the danger by tending to produce plastic or purulent iritis, but even then the danger of sympathetic manifestations is slight. If a foreign body complicates the injury the prognosis is still quite good, provided it can be removed through the original or a surgical corneal wound, either with or without iridectomy. The more the iris is lacerated the greater the tendency to consecutive inflammation. Displacement of the pupil, showing incarceration or folding of the iris, puts us on our guard, as it predisposes to sympathetic trouble.

Wounds of the lens are of serious import only through the production of cataract. This always follows any considerable solution of continuity of the lens capsule. A small lesion of this membrane, such as is occasionally produced by a pin or needle, may result in an opacity at or near the puncture only, but such an exception only serves to prove the rule that opening of the lens capsule results in complete opacity. The retention of a foreign substance entirely within the lens is comparatively devoid of danger to either eye, and the immediate or subsequent extraction of the lens, according to the amount of reaction following the injury, gives the eye the fullest opportunity for future usefulness. This is the only tissue of the eyeball which will admit of permanent retention of a foreign substance with anything approaching impunity. If the retained matter projects beyond the lens posteriorly the wound ceases to be a purely lenticular one, and other considerations influence the prognosis. Should dislocation of the lens into the vitreous chamber result from the injury, the prognosis is decidedly grave, and the eye will, sooner or later, need to be enucleated in most cases.

Penetration of the sclera, retina and choroid posterior, to a zone about one-fourth inch in width around the cornea, when comparatively clean and without retention of the penetrating substance, is not an especially serious lesion. The greater the prolapse of vitreous the more complicated

is the healing process, and the greater the danger of subsequent loss of vision through disorganization of the vitreous body, formation of connective tissue bands, and detachment of the retina. The immediate healing is usually satisfactory, subject to the exception of possible suppuration from uncleanliness of the wound, and the danger of sympathetic involvement is not great.

If a foreign substance is lodged in the vitreous chamber, an entirely different prognosis must be given. This is a condition which gives the least possible hope of saving the eye. A body other than steel or iron renders the case practically hopeless from the start, and enucleation must be practiced almost without exception. The decision is not based upon the size of the wound, or of the foreign body, but upon the fact that a foreign substance of any kind is not tolerated by the vitreous chamber, save in a small minority of cases, without sooner or later destroying the sight. With iron and steel the prospect brightens somewhat, though not to as satisfactory a degree as one might wish. A few statistics of magnet operations will serve to indicate the chances better and more concisely than a mere personal statement.

Neese, in the *Archiv für Augenheilkunde, 1888*, gives the following resumé of 154 attempted removals of steel from the vitreous: Sixteen cases (10.3 per cent) were given perfect vision. Forty-eight cases (31.1 per cent) had satisfactory vision. Twenty-seven cases (17.5 per cent) resulted in the preservation of a sightless globe. Sixteen cases (10.3 per cent) required subsequent enucleation. Fifty-five cases (35.7 per cent) were utter failures. Of these fifty-five cases fifty-two (94.5 per cent) were failures, because of the immobility of the foreign body. Hildebrand, in the same journal (June, 1891), presents the following statistics: Of sixty cases cited fifty-one were of foreign bodies in the vitreous; of these latter thirty-eight were removed (74.5 per cent). Sixteen had good vision (42.1 per cent). An exceptional injury of this character, which produces but

little disturbance, is one inflicted by a small piece of clean iron or steel which lodges firmly in the eye tunics. Several such cases are on record where good vision has been retained with entire cessation of irritative symptoms, the bit of steel being distinctly see by the ophthalmoscope.

Injuries involving the ciliary body in the so-called danger region, which corresponds to a zone of sclera about one-fourth inch in width just posterior to the cornea, are by all odds the most serious ones which we have to consider. Not only is the fate of the injured eye at stake, but that of the second eye as well. Simple, clean, incised wounds of this region heal well, and most of them never give rise to future trouble. The frequency of involvement of the iris or ciliary body in the scar, however, makes the danger of sympathy a real one. This danger is admitted by all observers, entirely independent of their belief as to the manner of involvement of the other eye. If a foreign body complicates the wound, and this foreign body can not be removed completely and without much manipulation, the eye had best be enucleated at once, provided the other eye is sound. I do not believe we ought to immediately sacrifice an eye when no foreign body has been retained, unless the injury is so gross, with so much destruction and displacement of the tissues, as to preclude the possibility of a clean healing. The most formidable wounds sometimes heal surprisingly well. If, after the healing is completed, the scar or the eyeball continues tender or painful, or the eyeball congested, the danger of sympathy is at its maximum. A cystoid cicatrix or secondary glaucoma also predisposes to sympathetic involvement.

Ohlemann (*Archiv für Augenheilkunde, August, 1890,*) estimates that sympathetic ophthalmia occurs in five per cent of all cases of perforating wounds at the corneoscleral junction. The experiments of Randolph, as detailed in the *Archives of Ophthalmology for June, 1888*, lead him to the conclusion that aseptic wounds of the eyeball, whether ciliary or not, produce but little disturbance.

This conclusion accords with the views of Mauthner and many other writers, but asepticity is, unfortunately, rare in such injuries.

The assertion of Spalding (*Boston Medical and Surgical Journal, July, 1891*), that the "eye of a child less than ten years of age, with a perforating injury of any sort in any region of the eye, ought to be enucleated at once, by reason of the greater tendency of children to sympathetic ophthalmia," while valuable as the opinion of an acute observer is, to my mind, too sweeping, and hardly justified by the experience of others.

I have to add a few words concerning the prognosis, as influenced by the character of the projectile.

Penetration by a splinter of wood is considered by most observers as exceptionally dangerous. There can be no question of this when there is retention. I have had a quite large experience with cases of injuries from this cause *without* retention, and they have, even when large and irregular, healed admirably, without exception. I am not prepared to give the reason for this. I trust that some of my auditors may do so.

An eye wounded by glass is often saved, say some writers. With me such an eye is invariably lost. Panophthalmitis develops speedily in every case. If, during the course of this inflammation, we make a free incision into the globe, and the glass escapes or is removed, the resulting stump need not be considered a source of especial danger to the other eye. Should the glass remain, enucleation is, in my opinion, advisable. The same statement will apply to cases of injury from gunpowder, although the demand for subsequent removal of the eye is not so urgent, owing to the friability of this substance.

Penetration of the eyeball by a pin is considered serious by reason of the septic taint which disposes to suppuration. I have had no experience with injuries of this kind.

Copper is an especially dangerous foreign substance in the eye. Its almost invariable septicity and the many difficulties — which it shares with all other substances save

iron and steel — surrounding the attempt at removal from the vitreous chamber, render its presence peculiarly obnoxious to the eye tissues. The same is true of injuries from bits of percussion cap, which, until recent years, were of frequent occurrence.

The observations of Landolt warrant him in saying that the propulsion of a foreign substance into the eyeball by the explosion of dynamite results in a wound more benign in character than one resulting from a percussion cap. He accounts for this by the theory that burning dynamite renders the metallic fragment aseptic, whereas a cap is apt to be greasy and septic.

The infrequency of panophthalmitis from lead particles induced Rolland (quoted in the Annual of the Universal Medical Sciences, 1888,) to experiment on rabbits with septic and aseptic metals in the vitreous chamber. His conclusion from the experiments is " that the comparative immunity results, not from the form or chemical composition of the lead particle, but from its asepticity, the result of the fire-bath it gets from the combustion of the powder generally preceding the accident." There is, however, in these later days, a form of injury, only too common, from lead where the fire-bath plays no part. I refer to the quite frequent injuries from cold shot, propelled from an air-gun or sling. These cases must be classed with the other septic penetrating wounds from glass, copper, percussion caps, etc., where removal is difficult, suppuration imminent, and sympathetic inflammation possible.

Wounds from steel and iron, with retention, are probably more common than any others. The chances for relief in any given case must be determined under the rules which guide us in the consideration of similar injuries from other substances, modified by our knowledge of the possibility of extraction by the magnet. The location and size of the fragment, and the ease with which it can be reached, are important factors in every case. The statistics of Neese and Hildebrand, which I have quoted, indicate the chances for success or failure.

THE USE OF THE ELECTRO-MAGNET IN REMOVING FOREIGN BODIES FROM THE EYE.

By Albert Rufus Baker, M. D., Cleveland.

While a student in Berlin, in 1882, I first saw Dr. Hirschberg make use of the electro-magnet for the removal of foreign bodies from the eyeball. The magnet he used at that time would only lift about twelve or fifteen ounces.

Immediately upon my return home, in the Fall of 1883, I had constructed this magnet, which I have the pleasure of showing you to-day. It will readily lift five or six pounds, and is but slightly heavier or more cumbersome than Prof. Hirschberg's magnet.

Owing to the inconvenience of transporting a fluid battery, Mr. Shackleton, my student, has constructed this dry-cell battery, which has been in use about four months, and, so far as I can see, is just as strong as ever. The principal objection to dry-cell battery is, that it will finally become exhausted, and the cells will have to be replaced by new ones. But I have no doubt they will last three or four years with the use an oculist requires of them; and as they only cost from fifty to seventy-five cents for each cell, the expense is not as great as that of rechanging an ordinary fluid battery. Six cells are used; they are hermetically sealed, and can be upset, or carried upside down, without any fear of damage.

During the past ten years I have probably made use of the magnet in one way and another in a hundred cases, and yet it is doubtful if its use has been of permanent value to patients in more than ten per cent, but it has been of use as a means of diagnosis in a number of cases.

In a few cases the results of its use have been brilliant, but these occur at such long intervals that the practitioner is often inclined to become discouraged in its use. One of the first patients in which I used it successfully was a child with a small chip of steel in the anterior chamber. The foreign body was removed so quickly and easily that it was with considerable pleasure that I undertook to remove, some months later, a small piece of the head of a nail from the vitreous humor of the eye of a young man, a carpenter, from Meadville, Pa. The piece of iron was very small, not much larger than a pin head, but could be seen with the ophthalmoscope as a bright, beautiful spot, almost in the center of the vitreous I made an opening in the sclerotic, opposite the foreign body, and upon entering the point of the magnet could hear the peculiar click indicating that it had come in contact with the piece of iron. Upon withdrawing the magnet it failed to follow. Notwithstanding repeated introductions of the magnet, I failed to secure it, and finally enucleated the eye. When I opened the eyeball, and laid it upon the table, and applied the magnet, the iron would be drawn to the magnet, and pull out the vitreous perhaps an inch, like a piece of rubber; in fact, I could lift the entire eyeball off the table with the magnet. In the light of my present experience, I think this eye was needlessly sacrificed, as I do not think that a piece of iron so thoroughly encapsulated could have done much harm if permitted to remain in the eye. I must confess, that this experience somewhat lessened my ardor in the use of the magnet, although I have had several cases since in which it has proved of great service. One case I recall, a Mr. Smith, from Conneaut, referred to me by the late Dr. Weed, who was struck in the eye by a scale which made a clean cut on the inside of the eyeball, which the Doctor supposed to be conjunctival only; he put in a stitch, and when I saw the case afterward, the anterior chamber was filled with blood. Upon bringing the magnet near the eyeball it would follow it, and the patient would

complain of pain. I knew at once that there was a foreign body in the eye; removed the stitch, and upon applying the magnet to the wound, withdrew a scale of steel as large as the nail on my little finger, and about the same shape. The eye made a rapid recovery, retained its natural size and appearance, but no useful vision. Another somewhat similar case was that of a young boy who, with some companions in the country, was playing "Warriors Bold—Knights of Old," with a couple of old axes, which they were slashing together, when a large three-cornered piece penetrated the eye of one of the boys. It was easily removed from the vitreous chamber with the electro-magnet, but it became necessary some time later to remove the eye for fear of sympathetic inflammation of the good eye.

This is the usual course these cases of foreign bodies in the vitreous pursue. There is so much injury done by the penetrating wound, that the eye is necessarily destroyed, even though the foreign body is removed, or, escaping this, a sympathetic inflammation is excited.

Recently, a somewhat more favorable case came under my observation. A young man, working in one of our large manufacturing establishments, was struck in the cornea with a small piece of steel, which was rather deeply embedded in the substance of the cornea. The physician, attempting to remove it, pushed it into the anterior chamber. The case was then referred to me. The piece could be seen distinctly at the lower part of the anterior chamber. Upon placing the magnet at the point of entrance, the piece of steel would jump up to it. Upon removing the magnet, it would drop to its former position. The wound was slightly enlarged, and it was easily removed with the magnet.

The electro-magnet has, in a number of instances, proved of great value to me in making a diagnosis.

In cases in which there is a piece of iron or steel in the eye, when the strong magnet is brought in contact with the

eyeball, and carefully moved in one direction or another, the ball will move with it, and the patient will complain of pain in the eye when the magnet is brought near it. Much care will have to be exercised or the surgeon will be misled by the patient's statements.

Prof. Stilling, I believe, has suggested that an immense magnet connected with a large dynamo might be used, so that when applied to the surface of the eyeball it would draw the steel through the tissues of the eye. If such a strong magnet should prove successful the expense would be too great for any one surgeon, but in a large city, where several oculists were engaged in practice, some hospital ought to be induced to put in such a magnet, and all the oculists, as well as other physicians, would be only too glad to send all their patients to an institution supplied with such an apparatus.

My experience would lead me to conclude that the electro-magnet has a limited field of usefulness in the removal of foreign bodies from the vitreous; that it is of much greater use in removing substances from the anterior chamber, iris and lens, and that it is of considerable value as an aid to diagnosis.

TREATMENT OF PENETRATING WOUNDS OF THE EYEBALL.

By B. L. Millikin, M. D., Cleveland.

Few subjects in ophthalmology are of more importance to the general profession than the proper and wisest course to pursue in cases of penetrating wounds of the eyeball. I shall consider the matter as briefly as possible, rather outlining general methods than attempting to give directions for specific cases. Every case must be a study by itself, and the best judgment of every man must be exercised when brought face to face with such an injury.

Three great cardinal points must be borne in mind in all cases, as the ground work of treatment, viz.: 1. The removal of the offending body, if present. 2. Thorough asepsis. 3. Rest of the organ. It is well known that certain regions of the eyeball are particularly sensitive and susceptible to serious results from injuries, such as the iris, and the ciliary body, and that the vitreous body is far more liable to infection than the anterior chamber, whether because the aqueous humor washes out the wound in perforation of the cornea, or whether the vitreous is a better soil for the culture of infectious material, it is not easy to say. If a foreign body is lodged in a region where it can be readily removed, it should always be extracted at once. If in the anterior chamber and loose, it can be extracted by making an incision in the cornea, and removed with the magnet, if iron or steel, or curette; otherwise with forceps. Or, if attached to the iris, a portion of this should be removed along with the "particle." If imbedded in the lens we wait until the lens has be-

come cataractous, when the lens and body may be extracted together in the lens capsule. When the foreign body is lodged in the vitreous it should be removed, if possible, or it may become encysted, and remain thus quiet for an indefinite period. Such cases should remain under observation. It should always be remembered, that every eye with a penetrating wound is in an exceedingly dangerous condition, and that the vast majority of such cases result in either impaired vision or total loss of the organ, with a possible involvement of the other eye, by sympathetic irritation. If a foreign body remains in the vitreous, and can be extracted either with the forceps or the electro-magnet, this should be done, and it may be reached either by enlarging the original wound, if necessary, or by making a new incision more advantageous in its position with reference to the foreign body. All incisions should be made in the longitudinal direction of the scleral fibers, and never crosswise, in order to produce the least possible gaping of the wound.

The greatest danger to an eye, the subject of a penetrating wound, is that of infection, and this must be the thought uppermost in the mind of the surgeon in treatment of these cases. As soon as possible, when a case of wound of the eyeball comes under observation, whether the foreign body be in the eye or not, the eye should be carefully cleansed; all blood clots, or other foreign matter, should be washed out with a solution of bichloride of mercury 1–5000, a saturated solution of boric acid, or, in the absence of these, boiled water will answer every purpose. It is a good precaution then to touch the lips of the wound with a stronger solution of bichloride, 1–2000, in order to destroy any germs which may have become lodged in the wounds. Many of the particles of steel and iron, which make up so large a proportion of the foreign bodies in the eye, have been hot before striking the eye, and such are, of course, not likely to be infectious. Every precaution should be taken, in the extraction of foreign bodies, to avoid infec-

tion. The hands of the surgeon should be scrubbed, the instruments and all dressings should be sterilized, and not only should the eye be carefully washed, but the edges of the lid should be scrubbed, best with a pledget of absorbent cotton, dipped in the solution of bichloride, and thoroughly rubbed along the roots of the lashes, etc., and also the external parts about the eye should be freely washed and scrubbed with soap and water and douched with the bichloride solution.

One is often surprised at the rapid and kind healing of these very extensive wounds of the eye under thorough aseptic precautions. By thorough aseptic precautions I mean not only the washing of the eyeball, but I mean everything which comes in contact with the eye, every instrument, every dressing, every solution, must be surgically clean. Solutions of cocaine and atropia should be made up either of distilled water boiled, or else several grains of boric acid to the ounce of the solution should be added, and this is an advantage in all solutions used about the eye. I know of no material so well adapted in every way for use about the eye, and, at the same time, so safe, as sterilized absorbent cotton. It is inexpensive, easily kept, easily sterilized, always clean. I do not think sponges should ever be used in eye surgery, unless it be in external plastic operations. Cocaine should be used as needed, and this has been the greatest possible boon to ophthalmic surgery, and enables us to manipulate the eye with little or no pain in all cases. In cases where there are extensive gaping wounds these may be inclosed with fine silk or catgut sutures. If the wounds are in the sclera, either by suturing the conjunctiva over the seat of the injury, or by passing them through the sclera itself, whichever may seem most advantageous in any given case. Small wounds do not need sutures, and often wounds of considerable size will do well without them. In certain regions, as the cornea, especially, or the corneo-scleral region, we have to deal with another element, viz., the

tendency to prolapse of the iris, and the same difficulty sometimes occurs in the tendency of the choroid and retina to prolapse in wounds of the sclera. An effort should be made to replace the prolapsed membrane, which can very often be done by manipulation of the spatula or curette. If the iris can not be replaced, the protruding portion should be seized with iris forceps and snipped off with scissors.

We now come to the third important step in the treatment of penetrating wounds, that of rest. Different opthalmic surgeons use different means for keeping the eye at rest after an injury, and I do not think it matters a great deal how we do it so the means be effectual. A simple, and I think a satisfactory mode of dressing the eye, and one to which I am rather partial, is to place a pledget of absorbent cotton, moistened in the solution of bichloride. 1–5000, over the closed eyelids, and over this a pledget of dry cotton, and then either a roller, flannel, or cheese-cloth bandage, especially if one wishes a little pressure to be exercised, or simply narrow strips of rubber adhesive plaster, which I have found very satisfactory. These do not keep the head hot and uncomfortable, afford a moderate pressure, keep their place well, and may be left on for several days if deemed advisable. Before covering the eye, I believe it is wise to instill a drop or two of a four-grain solution of atropia in it, both for its action on the pupil in cases of injury to the anterior portion of the eye, and also its action on the accommodation and ciliary muscle in all cases of injury.

When the dressings are once applied, I do not believe it is wise surgery to remove them frequently, especially in the early stages of the treatment. So long as a case goes on comfortably, the dressings may be left on two, three or even four days, without being disturbed, and to the great advantage of the injured member, as this method promotes the rapid healing of the external wounds. Unless there is some special reason to the contrary, the removal of dress-

ings comparatively early, as soon as the wound is healed, I think gives better results than continuing dressings too long. If there is an effusion of blood, or some similar condition, then the continuance of a mild pressure some days longer may have some advantage, but it is an exceptional case where the application of a bandage and dressing beyond the seventh day gives any advantage. After the removal of the dressings a pair of dark glasses and shade, to protect from the light, is all that is necessary. After the first few dressings, washings with the saturated solution of boric acid at frequent intervals keeps the eye clean and gives most comfort to the patient. Solutions of bichloride, even of the strength of 1–5000 or 6000, often produces much smarting and irritation and has no special advantage. If there is much aching pain through the eyeball or side of the head, I know of nothing which produces more comfort than hot applications at intervals, and continued for fifteen or twenty minutes. These should be used as hot as the patient can bear, cloths being wrung out of hot water and changed as quickly as they become the least cool. There is one drug, the use of which in all these cases, I do not think has been sufficiently insisted upon by most writers upon this subject, viz.: atropia. We have no means of so effectually putting an eye at rest as by means of this mydriatic, and I believe it is of the very greatest importance that the accommodation should be put at rest and kept at rest for a long period, depending upon the gravity of the injury in any given case, and especially is this true in cases involving the ciliary region or the lens. In injuries of the lens, where the development of traumatic cataract is so liable to occur, great good is unquestionably derived from keeping up the atropia, even for months, and lenses which have become opaque in portions will often clear up under the complete rest derived from the use of a mydriatic. Of course, one must always be on his guard against glaucomatous symptoms from its use, especially in elderly people. Finally, there is a very large class of cases so serious that

the restoration of even a partial amount of vision is out of the question. What shall we do with them? I am sure that it would be the part of wise and conservative surgery to enucleate all such at once, and save the patient great suffering, as well as much time. It is also a great question whether it would not be wiser, in cases of any severe injury to the ciliary region, to perform a like operation, or else resect the optic nerve, in order to avoid the possibility of that fearful calamity, a sympathetic ophthalmia, which thus far has baffled the skill of the wisest and most brilliant ophthalmologists.

MANAGEMENT OF THE STUMP IN AMPUTATIONS OF THE LEG BELOW THE KNEE.

By A. Rhu, M. D., Marion.

No doubt you will all agree with me that it is of prime importance to know *when*, *where*, and *how* to amputate a limb, especially is this true regarding the amputation of the leg.

In order to secure the splendid results of modern surgery, as well as to give our patients the ideal stump, it is my aim to present a few remarks on the management of the stump in amputations of the leg. The good stump should present the following: It should be well-shaped, have good circulation, be unirritable, and of proper length. To leave a stump in such a shape that an artificial support or assistance must, at best, be but imperfect, can not be too severely condemned by all well-informed and skillful surgeons. At this period we think more of the subject of securing a good stump than at any previous time in the history of surgery. The accumulated history concerning this subject has taught us that we, as surgeons, are largely responsible in securing either a good or bad stump. The stump, then, should be of proper length to provide leverage with which to propel the artificial limb; be of good shape; the flaps of proper length, and so placed that the minimum amount of pressure and friction is brought to bear on the stump, and that it should have a perfect circulation as well. In fact, the stump should be perfect, as far as regards the end covering of the bone, and have a clean linear cicatrix. The shape should be like a gradually-descending cone of symmetrical outline. This, of course,

presupposes that the bone has been well rounded and smoothed off on its outer border and anterior edge. It is my opinion that the ideal results of an amputation of the leg will be more fully realized if the point of selection be chosen at the junction of the lower and middle third; this will, at the same time, secure for prothetic art and science the adjustment of a modern artificial limb.

It will not be necessary to occupy your time in discussing the probable indications demanding an amputation of the leg. No doubt, that particular phase will be brought out by some one else. However, in our day, the aseptic surgeon is enabled to save many a limb, which, in the pre-antiseptic period, had to be amputated. From observation, I have also learned that not all who profess to be aseptic and antiseptic surgeons are such in fact; true, they may be enthusiastic advocates of antiseptics, and users of the bichloride and carbolic acid solutions, etc., and yet fall short in doing good antiseptic surgical work — simply because they have not yet learned to fully know what it implies to be *surgically clean*, and be the possessor of an aseptic hand and body, one acquired by a constant habit of general bodily cleanliness.

The pseudo-antiseptic surgeon is not enabled to secure for his wounds the splendid results of modern antiseptic and aseptic surgery, namely: Primary union as a rule, and the avoidance of sepsis. I also find that the doctors in general practice, who do surgical work only occasionally, forget the classical and theoretical canons of antiseptic surgery, alas! but too easily. From this we ought to learn that after all, it is no facile art to be considered an aseptic or antiseptic surgeon, and at the same time possess the necessary qualification and manual dexterity to properly carry out and comprehend the modern antiseptic surgical procedures. Now, then, if the surgeon who has performed the amputation be one of the modern aseptic school, the after-treatment will be at best uneventful.

The surgeon having first rendered the limb to be amputated aseptic, by the use of chemical antiseptic measures

best suited to the case, and taken full precautions to avoid septic infection from the amputation wound; or should the part to be amputated be already septic, he will use all modern means to eliminate the septic complications. The second step will be to minimize the tendency to hemorrhage, tie all vessels with aseptic catgut or silk, and cut these short, or, if ligatures are not to be used, practice modern torsion, then pull out the tendons and cut these short, then secure the nerve ends of the larger nerve trunks and cut these also short, in order to prevent neuromata formations, as well the painful and irritable stump complications. If, now, the flaps have been made of the proper length, the periosteum has been retracted from the bone, the final sawing of the bone should be done with a thoroughly antiseptic saw previously sterilized, the bone end should then be well smoothed and rounded off, the retracted periosteum secured over the end by a light catgut suture, carefully coapted and shaped. After being again well satisfied that the hemorrhage is under surgical control, the wound should be rendered dry by the use of antiseptic gauze. Away with your sponges, class them with the back numbers, if you are desirous in securing the ideal results of modern surgery. After having rendered the wound perfectly dry, and thus far the greatest care has been exercised not to introduce during the operation any material capable of setting up sepsis, we are reasonably certain, as a rule, that we will be rewarded by obtaining primary union, and not be worried by the after-results of the pre-antiseptic period, when the operator permitted the invited doctors to handle the wound surface, and in his after-treatment was, *as a rule*, confronted with the *opprobrium of surgery*, namely, *sepsis*, in the form of *septicemia*, *pyemia*, secondary hemorrhages—due to ulcerative processes, and perhaps gangrene. If we now have dried the wound carefully, the shaping of the flaps had best be again inspected. Now, the most important procedure of recent surgical methods comes, namely, the placing of

concealed or deep-buried sutures in the flaps, no matter whether the amputation be the circular or old flap. Begin by placing at the lower angle of the wound a row of aseptic catgut, tie these and cut them short, insert above this row of sutures another row in the same manner, until you have arrived at the skin flaps, always bearing in mind that the approximation of the wound should be perfect, and not leave pockets or spaces within the wound. In the ordinary amputation wounds only two rows of sutures are necessary. I have discarded the method of drainage with rubber and glass tubes or drains, and now use, as a rule; a strip of antiseptic gauze, placing the same from the bone outward to the most dependent wound angle. This in no wise interferes with the deep or buried sutures, and in my opinion affords the best mode of affecting modern wound drainage.

The placing of concealed sutures, to effect correct wound apposition, is a method of very great value; the result is always, without a single exception, successful in securing a good and correct stump, and one of the most reliable aids in securing primary union, provided, always, if the operating surgeon and his assistants were aseptic in all the minor details during the operation. The final skin coaptation suturing are now placed artistically, the suture line sprinkled with aristol, over this is placed a layer of aseptic gutta-percha tissue, surmounted by the antiseptic layers of cotton or gauze pads, well secured by a well-fitting and smooth gauze bandage. The gauze drain may be removed in from twenty-four to forty-eight hours after the operation. I make no use of adhesive strips. The first dressing may be changed, as needed, in forty-eight hours, otherwise it should not be disturbed for days. Such should be about the average management of the stump. In conclusion, I would call your attention to the following:

January 5, 1893, at the Cleveland, Ohio, meeting of the Erie Railway Surgeons, one of the most experienced New York surgeons said, that in his large experience,

covering some thirty years, he had as yet never seen an amputation wound heal by primary union, and did not think that such was possible, and that, if any surgeon could show him the result of a primary union, without suppuration, he would come and see such, though it would be necessary to travel hundreds of miles. Is this not an astounding admission to make in this nineteenth century? How near it corresponds to the account as found in Dr. Bell's book on Wounds, published in 1800, when he speaks of the French surgeons, who, in 1775, had had wounds which healed by primary union on the third day, and to which surgeon O'Halleran replies, with a readiness and ignorance quite unparalleled: "I would ask," says he, "the most ignorant tyro in our profession whether he ever saw, or heard even, of a wound, though no more than one inch in length, unite in so short a time" (three days). These tales are told, he adds, "with more confidence than veracity." Healing by inosculation, by first intention, by immediate coalescence, without suppuration, is merely chimerical and opposite to the rules of nature. Gentlemen, I trust you will let us hear from you whether or not this is true; I, for one, obtain primary union in my wounds as *a rule*. I am almost certain, beyond a doubt, that *many, if not all*, of you obtain primary union in your amputation wounds.

SOME INDICATIONS FOR AMPUTATION OF THE LEG.

By F. E. Bunts, M. D., Cleveland.

In presenting this subject to this Medical Association, I do not desire to convey the impression that I consider what I am about to say as essentially new, but rather to emphasize certain indications which seem to call for amputations of the leg other than those most commonly found in works on surgery.

1. I consider any injury to the foot so severe as to permit only of a Pirogoff, Symes or Chopart amputation to be an indication for amputation of the leg in the lower third.

2. Tuberculosis of the tarsal bones, except in children, should, with few exceptions, be regarded as an indication for amputation of the leg in the lower or middle third.

3. Those extensive wounds and burns of the soft parts, in which large portions of the integument and soft parts are destroyed, leaving the bone covered only by an extensive and tender cicatrix, should demand amputation.

4. Senile gangrene of the toe or foot should demand amputation of the leg above the bifurcation of the popliteal artery.

5. Shock, dependent upon a severe injury to the leg, in which it is obviously impossible to save the limb, should, if reaction does not take place in a short time, be an indication for immediate amputation.

The first indication, that in which a Pirogoff, Symes or Chopart amputation might be performed, is one which has been forcing itself upon the profession with increasing strength from year to year. The destruction of the arch of the foot, the uncertainty of obtaining useful stumps, the

inability satisfactorily to adjust mechanical substitutes for the portion lost after either of these operations, seems to me to justify our recommending an amputation at this time, rather than to be obliged later to see our patient forced to rely upon crutches, unsatisfactory and awkward substitutes for the foot, and most likely to undergo a reamputation before he can have fitted a limb in any way useful or comfortable.

That amputation for suppurating tubercular disease of the tarsal bones in adults will not be accepted by a great many as an indication for amputation of the leg, I am well aware; and yet the treatment of this disease has been so uniformly unsatisfactory, that I believe it should be considered an indication in most cases for amputation, rather than to allow the patient to continue with a practically useless foot, or to run the well-established risk of general tubercular infection.

We have all, perhaps, seen those extensive wounds of the soft part of the leg and foot, where cicatrization has been eventually complete, and yet, where, owing to extreme sensitiveness, or to the repeated occurrence of large and intractable ulcerative processes, amputation has been rendered necessary after years of suffering or disability to the patient; and in those cases in which we can forsee such a result, we should not let the importunities of the patient to save his leg blind us as to the ultimate consequences, or to the propriety of advising amputation, and then allowing the patient to take upon himself, if he choose, the responsibility of the future.

I am well aware that I am trespassing upon debatable ground when I advocate amputation of the leg or thigh above the bifurcation of the poplitical artery in senile gangrene below that point, but I feel sure that by its early performance the patient has a better chance for life and usefulness, suffers less pain, and runs less risk of septic poisoning than by that method which tells us to fold our hands and wait for the line of demarkation to form.

It is doubtful whether my last indication for amputation should technically be enumerated here; but what I wished particularly to call attention to was this, that a patient suffering from severe shock, as a result of a crush of the foot or leg, and who fails to react satisfactorily after not to exceed half an hour of intelligent effort directed toward restoring the circulation and body heat will, if he be not in a moribund condition, stand a better chance of recovery with an immediate amputation than to delay. Reaction will not be delayed by the operation, but rather will the continued presence of a crushed and mangled limb tend to perpetuate shock, and render sapræmia and septicemia more probable than a prompt and rapid bloodless removal of the foot.

In presenting these indications for amputation to your consideration, I have purposely avoided referring to statistical evidence for various reasons. Statistics, especially medical and surgical statistics, are capable of so many and opposite constructions, that they are often not only capable of conveying erroneous impressions, but may be absolutely dangerous. Nor have I related cases illustrative of the various propositions which I have stated, though I have considerable material for such illustration. I have rather preferred to state them briefly as the result of my clinical experience, satisfied that, had I appreciated them fully at an earlier date, I might have saved much suffering, and, I believe, a few lives. I trust that if any of the members here present feel called upon to criticise these indications, they will do so, using their clinical experience, and not statistical compilations, as a base.

DISCUSSION.

DR. LARIMORE.

I did not know the contents of the papers which were to precede me, and, not knowing exactly what was meant by "discussion," I have not prepared a paper. The point of election, while it may not now be regarded as a misnomer,

plays no part in amputation of the leg, as I understand it. It only indicated a point where the bones were sawed off a few years ago, when the patient had only the choice of a peg leg before him. The surgeon then was required to go up to the point of a hand's breadth below the knee-joint and take off the leg, so when the patient wore the peg leg the knee would be bent and the stump would not project beyond the peg. Now, amputation here, or at the old point of election, does not necessarily compel the man to lose the use of his knee-joint. He can still have the use of his knee-joint, so that I have this statement to make, that the point of election, or the place of election, as was known to the older surgeons, and seen in our text-books, is no longer to be considered. We now should seek to save all the leg possible. These are points of great importance, and should be kept constantly in view: First, have the stump so as to be able to bear pressure. Second, have the bones well covered with soft structures; and, Third, do not have the cicatrix terminal. The stump should bear pressure on the end, Now, this will decide the different methods of amputation. It will bar out all circular amputations of the leg. It will equally bar out lateral flaps, especially the lateral flaps of equal length, and takes into consideration other methods beside the commonly-accepted methods of accomplishing these results. For instance: If you amputate the lower third of the leg you will have to make an oblique incision, so as to bring up a great portion of the heel, and the cicatrix will be in front. You have then the skin tissue of the heel for the termination of the stump, and you will have the cicatrix in front. If the amputation is further up the leg, you will take a large posterior flap from the leg. This would form the end of the stump, and the resulting cicatrix would be in front. In most of these cases, also, the posterior tibial nerve must be dissected out. In the upper third of the leg, the flap will have to be taken largely from the external surface of the leg. Then you get two arteries in the larger flap in such a way that it will be well nourished. It is necessary to cut from without inward in order to give the flaps proper shape and not cut off the blood supply.

DR. THORNE.

I feel like endorsing practically all that has been said about the location of the cicatrix. The time has passed

for adopting or using the methods by which the cicatrix will be anywhere in the line of pressure. It is of extreme importance that the cicatrix should not be pressed upon. Do not understand me as saying the artificial leg will press on it, for it is pressed on only by a tension. I think, also, the time has now passed for any operation which will give us a muscular cushion over the end of the bone. All of the muscular tissue left is absorbed, and if not there in six months, it is clear to me that it should not be left there by the operator, for nature in health does not let any matter remain where it is not needed. I would also especially emphasize the necessity of the preservation of the periosteum beyond the line of section. A good stump is one in which there is no substance over the end of the bone other than the cutaneous and underlying cellular tissue. A good stump can not be secured by adhesion between the cicatracial tissue and the bone, and, in order to be successful in our efforts to prevent that, the periosteum should be turned down over the end of the bone. The tissue, which lies behind or outside the periosteum, uniting with the integumentary cover, will be firm, and we will, therefore, have no other than connecsive tissue and integument over the end of the bone; certainly no muscular tissue. I have devised an operation on the leg which has enabled me to escape this condition. I make an oval incision, letting the upper-angle point of the flap come some distance above the line of section, so the line of cicatrix is over and above the point of section of the bone. No part of the cicatrix is in contact with the end of the bone. This is an important point. The prevention of the consolidation is secured by saving the periosteum and covering the end of the bone with it.

Question.— Do you dissect up the tissue, make a circular incision and cut that off?

Yes; I avoid leaving any muscle tissue, because it is absorbed. I make the circular section of muscle down to the bones.

Question.— What do you do in a knee joint, where there is but little skin? I mean, what do you do if you have not enough tissue for the flap, and are limited for skin?

I either make my operation at the joint or above it. I do not make any operation that will encroach upon the articular or cancellous structure, except at the joint itself. It is the result of my observation that the grafted skin is not good to withstand even the pressure of the tension.

We always have some tension where the end of the stump comes down into the artificial leg. I try to prevent the end of the stump coming in contact with the instruments, because the weight of the limb will make tension. Engrafted tissue, as before stated, does not bear even tension well.

As to the best point of operation: Several different times in my life I have decided that question, and as many times changed my mind, so that now I confess myself somewhat at sea. I at one time thought the original point, at the junction of the lower and middle third, was the *sine qua non*, and again the junction of the upper and middle.

Just now I have under observation a gentleman and physician who has double amputation, one being at the lower and middle third, and the other at the upper and middle. He insists that the longer is the better stump—the more useful. He has both bought and made his own limbs, and is at present wearing those of his own make. He says that the amputation at the lower third gives him so little trouble that he scarcely notices it. I have also had another case under observation in which the same condition obtained, but in that one the operation at the upper is preferable.

In single amputations I have observed the same contrariety of conclusions.

One who saves all that is sound is, by such work, keeping the greatest distance from the body, and consequently reducing the per cent of objections and dangers.

DR. MERRIMAN.

I am particularly interested in this subject, because I have just successfully defended against a damage suit for $5,000 in a case of amputation of the leg below the knee.

The case was one in which the leg and foot, from about four or five inches below the knee, were totally crushed. The cause for action set up was, that the limb had been unnecessarily amputated, instead of having the bones set. They also claimed that, on account of its having been ignorantly and unskillfully dressed, the stump would not heal.

The operation was performed under the most unfavorable circumstances, the patient living in a room about ten or twelve feet square, containing all of his household possessions, in the night time by lamp light, four or five hours

after the accident had occurred. The attending physician administered the anesthetic, and my only other assistants in the operation were ignorant Finn laborers from the ore docks. After the limb was amputated and dressed my connection with the case ceased, the attending physician who called me to operate taking the further charge and treatment of the patient.

The patient made a good recovery, the stump healing perfectly, and the only fault that could be found with it was, that there appeard to be a slightly flexed condition of the stump, which might have been remedied by position or the application of a posterior splint in the after-treatment of the case.

Subsequently, the patient consulted a vender of artificial limbs, who informed him that the leg would require straightening before an artificial limb could be used with the best possible results. For this purpose he consulted a local surgeon, who was extremely unfriendly toward me, and who was afterward the principal medical witness for the prosecution. This physician, instead of performing a simple tenotomy, disarticulated and removed the head of the fibula.

When the case came up for trial the plaintiff undertook to ignore the pleadings, and secure a verdict on the grounds that the fibula had been sawed from a half to three-fourths of an inch longer than the tibia, and that the defendant had neglected the use of posterior splints at the time of amputation. It was also claimed that the fibula should have been disarticulated. The chief medical witness testified on the stand that the fibula was from one-half to three-fourths of an inch longer than the tibia; that no measurements were taken, but that its length was determined by feeling across the outer surface of the end of the stump; that in the operation the fibula should have been sawed shorter than the tibia, and that it was his invariable practice, in amputations of this nature, to cut the fibula shorter than the tibia by sawing diagonally across the bones; that he always used posterior splints at the time of amputation, and gave a number of cases in which he had operated in that manner.

This statement with regard to his method of amputation, employed in the cases he named, was contradicted by a witness called by the plaintiff, who was present and assisted in said operations, and who testified that at those

operations the bones of the leg were sawed straight across, and that no splints were used at the time of the operation.

I would like to know what the general custom of surgeons and members of this society is in the amputation of the leg, as to the cutting of the fibula shorter than the tibia, and the use of posterior splints at the time of amputation.

PELVIC CONTRACTIONS INDICATING SYMPHYSEOTOMY.

By Frank S. Clark, M. D., Cleveland.

It has been claimed that ten per cent of all women have anomalies of the bony pelvis, and three per cent of these require operative interference. This may be too large an estimate, but it is true that many women have difficult labors because of contractions of the pelvis. What operation will be most successful in these conditions is always a serious question. It is becoming more and more important, for our American women are not as free from pelvic contractions as formerly, and, too, immigration is bringing into our midst many of that class in which deformities are so prevalent.

Symphyseotomy, in certain conditions which we will consider, seems destined to take the place of the more serious operations hitherto used. Its indications in those cases of a normal head and abnormal bony pelvis will only be considered in this paper.

The application of this operation will depend upon how much the diameters of the pelvis can be increased by it. The amount of increase has been the subject of much controversy, the opponents of the operation attempting to prove that there will be no gain in the antero-posterior diameter, which is the most important one, without laceration of the ligaments of the ilio-sacral joints. No one denies an increase in the transverse and oblique diameters. The opponents have chosen for their experiments non-puerperal pelves, in which the joints and ligaments are not soft, and do not yield

as in a puerperal. By placing the patient on her back, with thighs and legs flexed and abducted, division of the symphysis will give a space of from two and a half to three inches between the ends of the pubic bones. This, according to Dr. J. E. Kelly, of New York, will give a separation of three-sixteenths of an inch at the anterior border of the ilio-sacral joint, the extreme limit possible without laceration of the ligaments. Dr. Wehle, of Dresden, has made the most extensive and scientific experiments with the puerperal pelvis, and claims that the motion of the ilio-sacral joint, after division of the symphysis, is a rotation outward and downward, three centimeters, or one and two-tenths inches, in the former direction, giving two centimeters, or eight-tenths of an inch in the latter. These experiments have proven conclusively that a gain of one-half inch is added to the antero-posterior diameter of the inlet, that is from the center of the promontory of the sacrum to the end of each pubic bone, the transverse and oblique diameters being increased one-fourth to one-half the distance between the ends of the pubic bones. Dr. Garrigues claims that, in addition to the half inch gained in the conjugate, the space between the ends of the divided bones aids materially in allowing the anterior parietal eminence to pass between and a trifle anteriorly to the pubic bones. The possibility of this gain depends on the absence of anchylosis of the ilio-sacral joint. Wherever anchylosis exists the positive statement can be made that in no contraction of the pelvis is this operation indicated.

In applying these facts, for such we may call them, we will first consider the deformities most frequently seen, and in which the antero-posterior diameter is shortened. These are the simple flat, rachitic flat, and generally contracted flat pelves. Two other varieties affecting the conjugate, though rarely seen, are the spondylolesthetic pelvis and the pelvis flattened by double luxation of the femurs. With these should be considered also the justo-minor-æquilabiter

pelvis. Dr. Hirst says that a pelvis must be considered *contracted* which has a conjugate of one-half inch less than the average, and *generally* contracted when all diameters are decreased four-tenths of an inch. The average antero-posterior diameter of the inlet is four inches, and in the deformities mentioned is the most important diameter to be considered. The biparietal diameter of the fœtal head lies usually in relation to the conjugate diameter, and is three and a half inches. It is claimed that during labor the bones of the head will be compressed sufficiently to decrease the biparietal diameter one-fourth of an inch, and that the soft parts of the pelvis will be compressed one-half inch, so that theoretically a three and a half inch biparietal diameter passes through a conjugate diameter of four and three-fourths inches, a gain of three-quarters of an inch. If we add to this three-quarters of an inch the half inch gained by our operation, we have one and one-fourth inches, which can be added to the conjugate of a contracted pelvis. If we deduct this from the average biparietal diameter, we have two and one-fourth inches, or, allowing one-fourth of an inch for the passage of the head, two and a half inches as the shortest conjugate diameter in which symphyseotomy is indicated. The highest limit should be at least three and a half inches, at which a high forceps delivery might be done, and doubtless has been, but with much danger to, and in many cases sacrifice of, the child and injury to the mother.

In those deformities, affecting the transverse and oblique diameters, we remember first of all that anchylosis of one or both of the ilio-sacral joints is frequent. This rules out of our consideration anchylotic transversely and obliquely-contracted pelves, oblique ovate, and coxalgic obliquely-contracted pelves. These, fortunately, and also the remaining ones to be mentioned, are rarely seen, and will be but briefly referred to. In these deformities the shape of the pelvis is so irregular that we are unable to make any general rule, as we can in the deformities affecting the true conjugate, but

each case must be considered by itself, as seen by the obstetrician. The diameters of the outlet are usually affected in this class of cases, the measurements of which are more difficult to make and less reliable than of the inlet. In osteo-malacic and kyphotic transversely-contracted pelves, varieties rarely seen, the bisischial diameter is the most important, and is normally four inches. As already stated, the transverse diameter is increased about one and a half inches in extreme cases, so that, other conditions being favorable, a diameter of two and a half inches will be the lowest limit in which a symphyseotomy will be permissible. I have seen the report of one case having a deformity in the bisischial diameter, in which delivery rapidly followed this operation. In contractions of the oblique diameters, in only a slight decrease from the normal, will this operation be indicated, because of the uselessness of one side of the pelvis in allowing the passage of the head. Of this variety, in which there is no anchylosis of the ilio-sacral joint, scoliotic obliquely-contracted pelvis is the only example.

I have had to limit myself more or less to the theoretical discussion of these contractions. Reports of cases are, however, proving that the theories are possibilities.

Before closing, it will, perhaps, not be out of place to refer to the recognition of these contractions. The simple flat and justo-minor æquilabiter pelves, and sometimes a rachitic flat pelvis do not show by any external appearance that they exist. In any case where the head does not readily engage, our suspicions should be aroused and investigations made. History of previous labors, if a multipara, or history of the mother's labors and the patient's childhood, if a primipara, will frequently give valuable hints as to existing contractions. Four external measurements will aid materially in making a diagnosis. They are the distances between the crests of the ilia, and between the anterior superior spines, the external conjugate, and the circumference of the

pelvis. The true or internal conjugate is, however, the most valuable. It may be estimated by subtracting from the external conjugate two and one-half inches for the thickness of the sacrum and one inch for the pubes and soft parts. But, since so much depends on a fraction of an inch, the internal measurement of the true conjugate should be made. In the justo-minor æquilabiter pelves all diameters will be lessened proportionately. In the simple flat a decrease in the true conjugate alone will be found, while in the rachitic the distance between the anterior superior spines will be equal to, if not greater than, between the crests of the ilia. The conjugate will be less than normal. In all other contractions there will be visible deformities to direct us in our measurements.

The methods of making the measurements I need not give. A pelvimeter, tape measure and the fingers are all the instruments needed. Any one with a little practice can make the measurements.

The subject of pelvimetry will become more and more important to the obstetrician, and I believe every primipara should have her pelvis measured before labor, and also those multiparæ who have had difficult labors. The external measurements can be made first and without exposure of the patient. If they are normal the true conjugate may be so considered without measurement.

DISCUSSION ON SYMPHYSEOTOMY.

By W. H. Humiston, M. D., Cleveland.

Consulting Gynecologist to City Hospital.

Indications for the operation of symphyseotomy, or delivery, by division of the pubic joint.

This old operation that the Italians have persisted in doing, is deservedly returning to repute. It is not surprising that this operation failed when we know of the meager knowledge that then existed in regard to pelvimetry, irregular and deformed pelves, and, not the least, the dire results from septicemia that so frequently followed the surgery of that day.

Of forty operations performed from 1777 to 1804, there were fifteen mothers and twenty-eight children lost. The results of the second forty were no improvement over the first. During the six and a half years, from 1886 to 1892, there were forty-four operations performed by various operators, with a mortality of one mother, three still-born children, and two children living twelve and seventy-two hours respectively. The publishing of this record gave a substantial standing to the operation, and it is now receiving the attention of obstetricians and surgeons the world over.

Dr. Harris has given out a late report, in which there is enumerated twenty-six operations, in which Italy contributed six, France eleven, Germany four, Austria one, and America four, with no mortalities. There are three unpublished cases since the above, with two recoveries, and one death. This one death was not due to the operation, but to a metroperitonitis, originating from a prolonged labor.

Success is assured if operation is done early, and strict antiseptic methods carried out.

Two and one-half to three inches separation of the pubic joint is safely obtained by symphyseotomy.

Symphyseotomy is indicated in patients at term with a living child in whom the true conjugate of the pelvic brim measures from 2¾ to 3½ inches. Where the pelvic diameter is smaller than this, the Caesarean operation should be performed.

At term, with impacted head, after failure to deliver with forceps, or to avoid extensive laceration of the soft parts, symphyseotomy should be performed, if the child is living. It renders premature artificial labor practical where formerly abortion was considered the sole resource, or where it is not desirable to have recourse to graver proceedings at the termination of pregnancy.

Associated with artificial premature labor, symphyseotomy permits intervention at a much later period in pregnancy, at a time when the child has more vital resistance.

At term, with a pelvis of normal dimensions, where an extosis or growth would prevent delivery with forceps, or version, symphyseotomy would compensate for the obstruction, and render delivery possible.

*There are cases in which, from a bad presentation of the head, delivery becomes impossible at a stage in which it would be equally impossible to do a Caesarean section. These cases are represented by face presentations—posterior chin. If the chin can be made to rotate to the front by any device, thus transforming it into an anterior face presentation, delivery is not particularly difficult; but where the chin fails to rotate to the front, and where the devices ordinarily employed are unsuccessful, I think it has been heretofore thought best to follow outt he view of Penrose, and many others—that the performance of craniotomy should be carried out at once. When there is a fixed and jammed

* Micheal.

posterior chin there is no sense in waiting. It seems to me that the operation of symphyseotomy could be applied to just such a class of cases, whether the chin or occiput was posterior, and the delivery impossible. It seems to me that we could thereby relieve the woman of danger, and deliver alive the child, which we would otherwise have to kill.

Symphyseotomy does away with the more fatal Caesarean operation in properly selected cases.

THE DIAGNOSIS OF EXTRA-UTERINE PREGNANCY.

By Howard W. Quirk, M. D., Cleveland.

There is, perhaps, no subject which presents points of greater interest or importance, alike to the physician, gynecologist, and surgeon, than the diagnosis of extra-uterine pregnancy, for upon its early recognition may depend the life or safety of the patient. Therefore, in a suspected case, we should ask ourselves, does the history of the patient previous to the time of the supposed conception point to a disease of the tubes, of a catarrhal nature, sufficient to destroy the ciliated endothelia, which are thought to aid the peristaltic action of the tube in transferring the ovum to the uterus, and also, in repelling the entrance of the spermatozoa? Although Dr. A. Martin, who has had such a large experience, and such phenomenal success in this class of cases, read a paper before the First International Gynecological Congress at Brussels,[1] in which he said that it was necessary to have the endotubal membrane in a normal, or nearly normal, state for a fecundated ovum to attach itself to a tube, but that the most frequent cause was some obstruction to the free entrance of the ovum into the uterus. Engstrom,[2] on the contrary, cites cases in support of his belief that the ciliated epithelia is always damaged, which is the generally accepted view; but he thinks there is always some obstruction to the free passage of the ovum.

There will usually be found a history of an obstructive dysmenorrhea and sterility, often with a presumption that the patient has had gonorrhea. There will not often, how-

ever, be a history of an inflammation, for the progress is so slow and insidious as to be unobserved by the patient, and the facts can only be drawn out by close questioning. The woman will usually have had no intermenstrual pain.

Dr. Knowlsley Thornton, in a discussion before the London Obstetrical Society, 1892,[3] demonstrated that salpingitis was painless unless a serous membrane became involved. Dr. Cutter[4] has also proved that this process is not of an active inflammatory nature, but more of an irregular hyperplasia, and a very vascular condition probably exists even before the ovum attaches itself. While a pyogenic membrane seems never to be the culture ground for a fecundated ovum, this condition may exist on one side with all its symptoms, and a perfect soil be present in the opposite tube. Then the usual history of a case prior to the time of the presumptive conception will generally be a heavy, dragging feeling in the pelvis, but with no particular pain, except in a slight degree at the menstrual periods; a vaginal discharge of an inspissated, cheesy mucus, or rarely, of a muco-purulent nature, this condition often existing for some considerable time previous to the cessation of menstruation. The cessation of menstruation generally first attracts the attention of the patient to something being wrong, although she is often deceived in this by the recurrent attacks of metrorrhagia, which are mistaken for menstrual periods, and consequently she neglects to consult a physician; unless obliged to seek relief by the distressing neuralgia felt in the back and down the limb, often causing lameness, with extreme tenderness throughout the abdomen. The hemorrhage will occur at irregular intervals, and is often only a gush of blood, rarely having the continuous oozing of a normal menstruation for a definite period. It may be continuous, however.[5] It most frequently appears about the eleventh week, although Dr. X. O. Werder reported a case before the American Gynecological Society of 1892, where the patient menstruated regularly up to the time of the rupture, which

often occurs at the fifth or sixth week; if it passes this period, it usually occurs from the eleventh to the thirteenth week. If the hemorrhage is very profuse in a woman who has had suppression of the catamenia, and other symptoms of pregnancy, for a number of months, and at the same time there is a discharge of a decidual membrane, accompanied by colicky pains, she may believe that she has aborted; and it may likewise be somewhat confusing to the physician, as the patient may have destroyed the discharged membranes. The uterus will be enlarged, and empty in both conditions. The presence of a vascular, globular tumor, either laterally or posterior to the uterus, of an extremely tender nature, which has grown very rapidly, so much so as to be weekly observed, with the previous history as above, points pretty conclusively to an extra-uterine gestation. It is well to bear in mind this matter of rapid growth. According to J. A. Mansell Moullin,[6] there is no pelvic tumor which equals it in that respect.

The distinguishing points between an abortion accompanied by a pyosalpinx, a hydrosalpinx, or a pelvic hematocele, and an ectopic gestation, will depend very largely upon the physical nature of the tumor. The outlines of a pyosalpinx will be of an elongated or sausage shape, while that of tubal pregnancy will be globular. A pus-tube will have a less elastic feeling under the finger, and more of a boggy or putty-like feeling. The outlines of a hydrosalpinx are not as well marked as those of a pyosalpinx, but the tumor will be much less firm and elastic than that of an ectopic gestation. And if the examination is made under the influence of ether (as it should always be), the recto-abdominal impingment of an impregnated tube may give to the rectal finger a feeling of a solid substance floating in a liquid, and may be made to rebound. No bony points will be likely to be discovered at an early stage, however. The patulent, soft os is not found in any other condition except in a uterine pregnancy, and here it is not so marked as in the extra-uterine variety.

Perhaps, before the patient comes to our notice, the tube has ruptured into the peritoneal cavity, and expelled all of its contents except the placenta, and the hemorrhage has ceased, which condition sometimes occurs, and does not cause death, as reported by Dr. Werder.[7] If such a state of affairs exist, it will be very perplexing so far as the physical examination is concerned; for the womb will be enlarged and empty, with a bulging cul-de-sac, and if the fœtus is small, it may be impossible to map it out distinctly, or, probably, to find it at all. The tube will be irregularly enlarged, and extremely tender. There will be a history of severe, colicky pains, followed by faintness, etc. However, this may occur also in a less degree from a ruptured pus-tube, but the symptoms of pregnancy will be wanting; and while, as a rule, the tube will be thickened, it will be empty. A pedunculated, intra-ligamentous fibroma may simulate and cause a suspicion of tubal gestation, as there will be a metrorrhagia, an enlarged, empty uterus, and, possibly, a disturbance of the stomach similar to that of pregnancy. The tumor, however, will be firm, solid, and neither elastic nor tender. An ovarian cyst, or a neoplasm of the ovary, will rarely be accompanied by the symptoms of pregnancy of a nature suggestive of tubal gestation. Intra-ligamentous cysts of the ovary are always attended by marked tenesmus of the bowels and bladder, and the symptoms of pregnancy are always wanting.

In the majority of cases rupture has occurred before a diagnosis has been made, and some entertain the belief that a diagnosis can not be made before this occurs. Neither is it always possible to distinguish between an extra and an intra-peritoneal rupture; the latter is the more frequent. The shock will be greater the longer the gestation has existed; also more severe in intra than in extra-peritoneal rupture; tenesmus of bowel and bladder are more frequent in the extra than in the intra-peritoneal rupture; an indefinite, boggy mass will be present in either condition, but if

within the enveloping peritoneum, will give to rectal or vaginal finger a feeling which has often been mistaken for fluctuation, but, upon opening the abdomen, has been found to be clotted blood. If the fœtus does not die at the time of rupture, its movements may be felt, and later, the fœtal heart sounds may be made out.

Dr. G. J. Engleman,[8] of St. Louis, has reported a case in which the abdominal and uterine walls were so thin at the fifth month that the outlines of the fœtus could be distinctly made out, and it was supposed to be outside of the uterus, but repeated examinations caused a fœtus to be expelled per utero. This rare abnormality should be borne in mind. But in this case the cervix was low in the pelvis, and should have awakened suspicion, for in the majority of the tubal pregnancies it is not so; besides, few cases reach the fifth month without a history of rupture.

SUMMARY.

To summarize briefly, the salient points I would emphasize are:

1. A history of some pelvic trouble and sterility.
2. Symptoms of pregnancy.
3. A soft os, more patulous even than in urine pregnancy.
4. Very rapidly-growing, globular-pulsating tumor, of an *extremely tender nature.*
5. Greater pain radiating from the tumor than ordinary growths produce.
6. The discharge of decidual membrane or tissue.
7. Metrorrhagia.
8. Syncope, following severe, cramping pains, of a tearing or boring character, at the fifth or sixth week, or at the eleventh to the thirteenth weeks.

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THE PLACENTAL BLOOD SUPPLY OF ECTOPIC GESTATION.

By D. Tod Gilliam, M. D., Columbus.

The distinctive characteristic of operations for advanced ectopic gestation is the presence of the placenta, and the necessity of dealing with it. If this feature were removed operations of this kind would be classed among the most simple. It is the live placenta that stays the hand of the boldest surgeon. It is this that led to the adoption of halting and timorous surgery, and formulated the rule of non-interference. There is no progressive surgeon to-day that does not deplore the necessity of leaving the placenta *in situ*, to come away piece-meal, by slow process of disintegration, entailing suspense, long-suffering, and subjecting the patient to the imminent risk of hemorrhage, suppuration, and septic infection. The other alternative, of sealing up the placenta, while in many respects preferable, still carries with it all the danger and disadvantages of an incomplete operation, and leaves so much to fortuitous circumstances as to place it in the category of the unsurgical. Undoubtedly, there are, and will continue to be, cases in which we shall gladly avail ourselves of one or the other of these alternatives. Just as we are now occasionally compelled to resort to undesirable retrenchments along other lines of abdominal work; but to my mind, the ideal operation for ectopic gestation, and the one of the near future, will consist in the total extirpation

of the ovum, including the placenta. The pioneer work in this line has already been accomplished; but, as yet, the operation has not risen to the dignity of a rule of practice, but rather appears in the light of brilliant and exceptional achievement, or as the result of favoring conditions. My reasons for believing that the removal of the placenta will be found to be so generally practicable as to insure its adoption are briefly given below.

1. Extra-uterine pregnancies, almost without exception, are in the beginning tubal.

2. The future site of the placenta is determined at a very early period by concentration of the chorionic villæ, and this will be implanted on the mucous membrane of the tube.

3. The embryonic placenta once having taken root may not be dislodged without destruction of the embryo, for the nutritive processes are so active that death must swiftly follow the arrest of nutrition, consequent on such a severance; besides, an immediate secondary implantation could not be effected. It would be as reasonable to attempt to transplant a bunch of hair from one part of the scalp to another as to expect perfect adaptation of the chorionic villæ or placental tufts to other parts than those into which primary development took place.

4. After rupture of the tube, whatever becomes of the fœtus and its envelopes, the placenta keeps its moorings, if life continues.

5. In the subsequent development of the placenta it spreads out and apparently takes hold of other organs and parts. Here hinges a vital question, for, if the placenta does actually attach itself to and draw its blood supply from these other parts, the removal of the placenta will often be an extra-hazardous and not infrequently an impossible feat. I believe that in practically all cases this attachment to other organs is only apparent; that the nidus into which the placental tufts are implanted, and from which they draw their blood supply, is an outgrowth from the tubal structures,

supplied by the same vessels and under the dominance of the same nerves. My reasons for this belief are:

a. No part outside the utero-tubal tract has been known to respond to the presence of the fecundated ovum by undergoing those changes and making those preparations that would enable it to live and thrive; hence, it is that extra-uterine pregnancies are tubal and nothing else. If these parts, under a different vascular and nervous system will not respond to the ovum, how can we expect them to respond to and make provision for the placenta? It would seem that such structures are not adapted to the process.

b. In the apparent attachment of the placenta to other parts, we have an analogous condition in many of the cystic and solid tumors of the abdomen, wherein a membraneous expansion follows the tumor upward from the pedicle, binding it to contiguous structures, and bleeding freely when such adhesions are severed, and yet, every abdominal surgeon knows that the blood is not furnished by the viscera from which the tumor is being detached, but from the membrane, and the quickest and most effectual way to stop the hemorrhage, is to clamp the pedicle. The blood supply came from the site of original implantation of the growth, and was under the dominance of the system of vessels and nerves, under which it took its origin. We know, furthermore, that the pedicle being clamped, there is little fear of alarming hemorrhage from the many points of contact of other viscera, unless, perchance, violence be done to the structures of the same, and such hemorrhages are generally left to take care of themselves.

c. Again it has been observed and commented on time and again, that a ligature or clamp applied to the broad ligament at the angle of the uterus, will almost invariably stop the hemorrhage of an ectopic gestation.

Thinking men have long felt that there must be something wrong with the anatomical descriptions of the circulation of these parts, else how could a clamp applied to the

distal end of a vessel influence a hemorrhage above it? And yet the books taught us that the ovarian artery on its way from the pelvic walls to the uterus gave off three branches: one to the ovary, one to the tube, and one to the fundus uteri. I have time and again, in my lectures to the class, expressed my doubts as to the correctness of this, for the reasons given above, and now we are informed that the ovarian artery splits up into a dozen or more branches at the angle of the uterus, and that *recurrent* branches are distributed to the tube and ovary. If we are able to anticipate such a discovery by process of mind, and in the teeth of staid and long-accepted anatomical data, may we not carry our reasoning a point further, in order to account for phenomena that admit of no other explanation?

The vascular system of the matrix of the placenta of ectopic gestation has not, so far as I know, been worked out. It is even denied that there is any maternal side to the placenta. We are told, it is true, that in the tube there is an enormous increase in vascularity attending the condition, and that the fœtal tufts float in the blood of the maternal sinuses, but nowhere are we told of the continuity or disjunction of the vascular system that furnishes the blood supply. This is a vital question from a practical standpoint. If I am right in my deductions, the blood comes from one source, and that is the tubal circulatory apparatus. I had a case of ectopic gestation a few months since, in which the placental implantation was apparently entirely extra-tubal, and on the posterior aspect of the uterus and its peritoneal investment. A clamp applied to the broad ligament, at the angle of the uterus, effectually controlled the hemorrhage. Why should it do so, if the blood source was not tubal? Another case, a few days since, of somewhat similar character, was dealt with in like manner.

Then, to recapitulate:

1. The primary placental formation is always within the tube.

2. If once tubal, always tubal, for transplantation, with continued vitality, is inconceivable.

3. In the subsequent growth the matrix is an outgrowth of the tube, and under the dominance of the same set of blood-vessels and nerves.

4. It does not, therefore, draw its blood supply from the extra-tubal structures, to which it is seemingly attached, but from the original source.

THE INDICATIONS FOR OPERATIVE TREATMENT IN EXTRA-UTERINE PREGNANCY.

By Marcus Rosenwasser, M. D., Cleveland.

It is our duty to educate the general practitioner that he may readily recognize ectopic pregnancy—a condition conceded to be quite common and to be as controllable as it is common, provided it be early recognized. When a presumptive or positive diagnosis has been made, it is essential and to the interest of the patient that, unless the attendant be himself fully competent, early consultation be had and the further management be shared by the consultant. I deem it improper—nay, extremely hazardous—for the physician to alone assume control of a case fraught with such awful consequences, and to dictate the time and the indications for operative procedures. In outlining these indications, I would have it understood that the surgeon, and not the attendant, be the judge of, and responsible for the ultimate decision whether to operate or delay in a particular case.

What a "snap" would be my portion in this discussion, and what a relief to my audience, if I could but conscientiously subscribe to the commonly-accepted dogma: "When you find an extra-uterine, early or late, remove it." I would not pluck one leaf from the laurel of the distinguished pioneer in pelvic surgery who first enunciated this axiom. But following at a distance the rough path by him hewn in the primeval forest, I would with due appreciation of the now easy task, tarry by the wayside and restore to its native soil the tender plant ruthlessly uprooted and tramped under foot by the zealous explorer and his daring followers.

During the early months of extra-uterine gestation intra-pelvic hemorrhage constitutes the only primary danger. This hemorrhage may be *free* into the peritoneal cavity, without limitation, causing the death of its victim within a few hours, or at most a few days. We can not go amiss in laying down the indication for this condition, even if the diagnosis have proved erroneous. What matters it if, instead of ruptured tubal pregnancy, we find on section the case to be one of ruptured appendix, or ruptured pus tube, or ruptured gall bladder, or twisted pedicle? The indication holds alike for all. Along the same line of reasoning we are justified in demanding surgical interference, as a prophylactic measure, before rupture has taken place, whenever a presumptive diagnosis of the condition has been made. For, in that event, we will also find some abnormal state in the pelvis warranting such procedure, should the diagnosis of ruptured tubal pregnancy be not sustained. Only recently I encountered a case with all the symptoms usually ascribed to early ectopic gestation, to find on opening the abdomen, on the side where I suspected the ruptured tube—an abscess in the broad ligament adjacent to the right cornu of the uterus, and on the side where a pus tube was supposed to be lurking—a small myoma in the corresponding portion of the left broad ligament. The operation was indicated, though the diagnosis proved incorrect.

When the hemorrhage is *not free* or violent, but *circumscribed* within palpable limits, whether it be extra-peritoneal or intra-peritoneal, there is no immediate danger threatening the life of the patient. Hence, the indication for interference must be evolved in accordance with the results of cumulative experience. This experience teaches us that the hemorrhage has been at least temporarily checked. Whether the bleeding has been limited, by taking place into the broad ligament, as Tait would have it, or whether it has been limited by pre-existing adhesions and false membranes, or newly-formed plastic material within the peritoneal cavity,

as Price maintains, does not concern us clinically. The undisputed fact remains, that where the hemorrhage has formed a distinct tumor (pelvic hematocele), the large majority of patients get well by letting them severely alone. But can we make the diagnosis? Tait (page 460, "Diseases of Women and Abdominal Surgery") admits of no doubt on that score. He says: "The diagnosis of tubal pregnancy at time of rupture may be made with certainty seven times out of eight, and may be guessed at in the eighth instance." Can we distinguish between the two varieties of hemorrhage? The same author (page 469) says: "An intra-peritoneal hemorrhage, unlimited in quantity or by membrane, has never yet been felt by me as a definite tumor above the brim, and I have now had a large experience of such cases in which the diagnosis was confirmed by operation or post-mortem." The diagnosis then is not difficult. What is the natural termination? Still quoting the same author (page 460): "The intra-peritoneal ruptures seem to be almost uniformly fatal (meaning free hemorrhage). Whilst the extra-peritoneal hematoceles (circumscribed hemorrhage), whether arising from tubal pregnancies or not, should certainly be left to take their own course unless they give signs that they are suppurating." Again (page 470): "But I feel sure that the great majority of these cases (intra-ligamentary tubal rupture) end then and there by the natural cure as mere extra-peritoneal hematoceles; the ovum dies and everything is absorbed." My own very limited series of observations, which will probably not differ materially from the experience of others, tallies in description and results with the statements of Tait. Of sixteen cases of circumscribed pelvic hemorrhage, nine, being more than a majority, made perfect recoveries by being kept absolutely at rest; in six only were there definite causes for operation. If we act promptly on the appearance of these definite causes, we shall neither be shocked at "the horror of some of these very recoveries" (Price), nor heap reproach upon our art by

the "life of chronic invalidism" (Bland Sutton) to which our patients are condemned. But *we will cut down the number of abdominal sections unnecessarily performed throughout the land by several hundred annually.*

I have elsewhere (Paper to be published in Vol. VI, Transact. Amer. Assoc. Obstet. and Gynecol., 1893,) made a plea in favor of *vigilant delay* in circumscribed pelvic hemorrhage. By vigilant delay is meant a careful, close surveillance of the patient *at absolute rest*, continued until shrinkage of the mass indicates absorption; or until symptoms of recurrent hemorrhage, or growth of surviving fœtus, or symptoms of suppuration, or of pressure, demand active surgical interference—a demand at once imperative, should circumstances render intelligent, watchful supervision impracticable.

From a careful study of the arguments advanced by those who advocate indiscriminate operation, be the hemorrhage free or circumscribed, I am led to conclude that they have been frightened, so to speak, into the belief that ruptured tubal pregnancy means almost certain death. The panic, caused by the swift and appalling death, due to free hemorrhage, has so relaxed their reasoning faculties that they fail to accept salvation other than that by the knife and the ligature, even though the accident be under control and almost free from danger. In proof of my apparent presumption, permit me to weary you with a few more quotations. From Dr. Joseph Price, on "Tubal Pregnancy," in the *Amer. Jour. of Obst.*, for November, 1892, page 862. Pleading for early recognition and early extirpation of extra-uterine gestation sac and contents, one of the strong arguments is "Dr. Formad's report of thirty-five post-mortems in which he found ruptured tubal pregnancy — thirty-one of them had died within a few hours after the appearance of unfavorable symptoms." On page 875 he quotes Dr. Berry Hart: "Who has given the subject very patient and studied investigation, and discusses it from a high surgical standpoint," "As all

know, the Fallopian tube is, in the majority of instances, the starting point of extra-uterine gestation, the most common result of this is that rupture occurs usually at the second month, through some part of the tube covered by peritoneum — a result almost universally fatal if left alone, and is invariably curable if operated on in time by abdominal section." From Dr. X. O. Werder, on "Moot Points in Ectopic Gestation," in the Transact. Amer. Assoc. Obst. and Gynecol., Vol. IV, 1891, page 208: "We have, therefore, five cases out of a total of six in which there is a strong probability of recovery, though undoubted rupture into the peritoneal cavity had occurred. Ordinarily, we could hardly expect such favorable results, but I feel confident that the percentage of recovery is much larger than we have been led to believe. Granted, then, that this is the case, should we change the method of treatment of this affection now generally advocated, namely, laparotomy, as soon as this condition is recognized? I would say, emphatically, No! There is too much uncertainty in this matter, and while undoubtedly many would recover without operation, there is a very large percentage which only prompt operation can save; unfortunately, we have no means of knowing which are the fortunate cases that would escape a fatal termination. Within a year I have had an opportunity to see two specimens of tubal pregnancy removed post-mortem from cases unknown to me, which, probably, could have been saved by prompt operation; one of these, whose ovisac was not larger than a raspberry, died in a little over five hours." I will not exhaust your patience by multiplying instances of such misdirected zeal, born of abject fear. Let these suffice.

When ectopic pregnancy has advanced beyond the early stage (three months) either because it was not recognized, or because the patient refused operation, the early extirpation of the gestation sac will save her from the dangers that increase with the advance of the pregnancy — secondary rupture, peritonitis, hemorrhage from multiple adhesions of

placenta to omentum and intestines. The mother may choose to chance the delay for the sake of saving the child. At or near term, two lives being at stake, operation ought not be postponed until after missed labor—thus sacrificing the child—but should be performed at the risk of possibly increased placental hemorrhage. With a dead fœtus in the gestation sac, the danger of sepsis offsets the danger of alarming hemorrhage, should it occur. Whether or no to operate on a encysted fœtus or lithopædion would depend on the symptoms presented by the individual case. No hard and fast rules can possibly apply.

I have endeavored in this necessarily brief discussion to show that the primary danger in ectopic pregnancy is from hemorrhage; that this hemorrhage is in most cases intra-peritoneal, and that it is *rapidly fatal only when the bleeding is free.* When the hemorrhage is circumscribed there is no immediate danger; the large majority of cases make perfect recoveries without operative interference; only a small minority require operation for special indications. Upon these facts we venture to base the following

CONCLUSIONS:

1. To prevent free hemorrhage, remove the unruptured sac whenever a presumptive diagnosis is made.

2. Operate early in all cases of *free* hemorrhage.

3. In cases of *circumscribed* hemorrhage operate for definite cause: *a* Recurrent hemorrhage; *b* Suppuration of mass; *c* Growth of surviving fœtus; *d* Interference of vital functions by pressure.

4. Early operation is advisable in advanced ectopic pregnancy, but circumstances and individual experience justify deviation from the rule.

OPERATIVE TREATMENT OF EXTRA-UTERINE PREGNANCY.

By Rufus B. Hall, M. D., Cincinnati.

In considering the operative treatment of extra-uterine pregnancy, the subject may be divided into, two stages with subdivisions, thus simplifying it very much. For all practical purposes this is much to be desired. First—Operation before the fourth month; Second—Operation after the fourth month. The fact that the vast majority of cases will come under the physician's observation at the time of primary rupture, and this is usually some period between the fourth and twelfth week of gestation, makes this the most important division for both the patient and physician. But the cases, as a rule, do not come under the observation of the operator until several weeks later. The excellent results which have followed the treatment of these cases by abdominal section has established this operation on as secure a basis as ovariotomy. Therefore, methods which were formerly advocated, such as killing the fœtus by injecting drugs into its body, or by electricity, and similar unsurgical procedures, are of such an unsatisfactory character that they will not be considered.

Operation Before the Fourth Month.—It is true that the gravid tube has been removed before the period of rupture; yet, this operation is so rare that it need not concern us in this discussion, and in most of the cases in which it has been done the true nature of the tubal disease was not known until after the operation was made, as in the case reported some months ago by me. The risk and difficulty of an opera-

tion for extra-uterine pregnancy before the fourth month depends largely on two factors: First—The period of gestation; Second—The period of time the patient has been under palliative treatment after tubal rupture, before the date of the operation. If gestation has not advanced beyond the eighth or ninth week at the time of tubal rupture, and the operation is made without delay, the mortality would be very low, but the majority of cases come under the observation of the operator at periods varying from a few days to weeks, or even months, after the tube has ruptured. During all this time the patient is losing more or less blood, owing somewhat to the size and location of the rent. When the tube ruptures, the hemorrhage may not be so profuse as to cause death. The patient, recovering from the shock, does not manifest such grave symptoms as to convince the medical attendant of the necessity of immediate surgical interference. The result is, the patient remains several weeks under palliative treatment unless a renewal of bleeding kills her, a condition which I have seen in consultation twice within one week's time quite recently. One of the patients had a primary rupture six days before death, and the other five weeks before, both dying without an operation. Hence, when the symptoms of hemorrhage are unmistakable, abdominal section should be made without delay. This practice is in strict accordance with the canon of surgery valid in other regions of the body, viz., arrest hemorrhage at the earliest possible moment. If this rule were strictly and faithfully followed, many lives would be saved which are now sacrificed. In all cases upon which I have operated several weeks after rupture of the tube had taken place, blood-clot, varying in quantity from one to six pints, was found free in the peritoneal cavity. All of the operations were made from three to eight weeks after primary rupture, except one, which was thirteen weeks after rupture. The blood-clot varied in consistency and color, some parts of it being quite dark and firm; others, more nearly the natural color, and not so thoroughly

organized, showing the bleeding took place at different times, the more fluid portion of the blood being absorbed, leaving a blood-clot. In performing the operation on these patients, who are already greatly enfeebled from the intra-abdominal hemorrhage, many of them having had two or three, or even four different attacks of bleeding, we should exercise great care to control the loss of blood during the operation, as this is the complication to be most dreaded in the management of these cases. This is best done by making a free abdominal incision, three to four inches in length, grasping the tube next to the uterus with the fingers of the left hand, and placing a temporary ligature before any attempt is made to clear the pelvis or abdomen from blood-clots. This is one of the most important points in the technique of the operation, if not the most valuable, as a life-saving measure in dealing with these important cases. The loss of blood should be prevented in making these operations, as far as possible, and the technique should be carefully studied with this important object in view. After we have made certain that the ligature has been so placed that the hemorrhage is thoroughly and completely under control, we at once clear the pelvic and abdominal cavities of blood-clot with the hand and irrigator, thoroughly satisfying ourselves that no large blood-clots remain, especially in the iliac fossæ. The irrigation should be made with the gravity tube, and the cavity drained afterward. The tube and ovary constituting the sac should *not be cut away* until after all of the intra-abdominal manipulation has been made, for fear the ligature is displaced during the subsequent steps of the operation, an accident which is much more likely to occur in this than other abdominal operations, owing to the soft and friable condition of the pedicle. Packing the pelvic cavity with iodoform gauze is a very valuable adjunct, in some cases, permitting us to at once close most of the abdominal wound and put the patient to bed. In one of the cases, after enucleating the sac from behind the uterus, I found that

I had injured the rectum in Douglas' cul-de-sac, there being a destruction of tissue and an opening into the rectum as large as the end of the finger. The fact that the peritoneal surface was entirely stripped from that part of the intestine, made a resection or an artificial anus out of the question. I packed the pelvis thoroughly with iodoform gauze, closed the abdomen, made forcible dilatation of the sphincter ani muscle, and put the patient to bed. The bowels were moved on the fourth day, the gauze was removed the fifth and sixth days, leaving a fistulous opening, which closed at the end of the fifth week, and the patient made a complete recovery. Without the gauze packing in this case, I know of no other means by which we could have saved the patient's life. All of these cases should be drained, and the drainage tube carefully attended to by the physician himself, or a competent nurse. The after-treatment differs but little, if any, from that of other abdominal operations.

OPERATION AFTER THE FOURTH MONTH.— In those comparatively rare cases, where the disease has advanced beyond the fourth month, the placenta has become too large to remove the embryo, tube, ovary, and that portion of the broad ligament constituting the sac; therefore, we have obstacles to overcome not met with in the earlier months of tubal gestation. The placenta and sac now encroach upon the adjacent pelvic organs, involving the uterus, rectum and bladder, and therefore can not be so readily and summarily dealt with. After the fifth month the operative measure must be considered under two headings: First —Treatment of the sac; Second —Treatment of the placenta. Experience has proven very clearly that the safest plan is to incise the sac, remove the fœtus, and stitch the edges of the sac to the abdominal wall, making liberal provision for drainage. In those cases where the gestation has well advanced, the peritoneum may be so removed, that, by making the incision to the side and not in the middle line, as in an ordinary section, the

sac can be opened without opening the peritoneal cavity at all. This will be better understood if we recollect the fact, that all or nearly all the full-term pregnancies are those which have grown in the folds of the broad ligament and are really extra-peritoneal. As they grow they separate the folds of the broad ligament, and finally lift the peritoneum slowly up out of the pelvic cavity, as well as from the anterior abdominal wall.

How to deal with the placenta in those cases which are far advanced is a very perplexing question. There is no doubt that the situation of the placenta influences the maternal results very much. The most favorable cases are those in which the placenta is in the pelvis below the fœtus, where the sac can be opened without disturbing or detaching it during the operation, and the most unfavorable are those in which the placental relations must be disturbed during the operation. Some operators have removed the placenta with success, others have left it to gradually slough away, taking care to provide for free drainage, with equal success. In a few instances the sac has been thoroughly cleansed and closed, and the placenta not disturbed, the patient recovering.

Treat it as we may, it is more than probable that before the termination of the case we will wish we had adopted some other plan. With our present knowledge, the rules may be formulated thus: First — When the placenta is situated above the fœtus, it is good practice to remove it with the fœtus; Second — If the placenta becomes partially detached during the operation, it must be removed; Third — When the placenta is below the fœtus, it may be left undisturbed; Fourth — Should the placenta be left, the sac closed and symptoms of suppuration occur, the wound must be reopened and the placenta removed; Fifth — If the fœtus has been dead for some time before the operation, the placenta can be removed without risk of hemorrhage.

SYMPHYSEOTOMY.

By J. F. Baldwin, M. D., Columbus.
Professor of Surgical Gynecology in the Ohio Medical University.

In 1819, Ambroise, an anatomist of Paris, demonstrated the feasibility of the operation of pubic symphyseotomy, on the body of a woman who had just been executed a few hours after delivery. Vesalius, the noted anatomist, taught the operation in 1564, and Pineau wrote about it in a work published in 1598. A copy of this book is known to have fallen into the hands of Sigault, of Angers, then a medical student. He studied the subject carefully, and wrote a thesis upon it, which he presented to the Royal Academy of Paris, in 1768. His thesis was not well received, but in 1773, Leroy, then Professor of Obstetrics in the Medical School of Paris, repeated Sigault's experiments, and favored the operation. The first opportunity for its performance presented itself September 30, 1777, when Sigault, assisted by Prof. Leroy, operated upon a woman in labor for the fifth time, who had been previously delivered of four dead children, after prolonged manipulation. The operation was not very skillfully performed, but the woman made a slow recovery, and the operation was regarded as a brilliant success. Owing, however, to the slovenly methods in vogue at that time, subsequent operations were not very successful, and the operation fell into disrepute, and became practically abandoned.

As indicating the value until recently placed upon it, I will quote from standard obstetricians. Ramsbotham says: "The operation is not justifiable in cases of the more deplorable distortions of the pelvis, or in the smaller

degrees of diminution, because in them craniotomy can be performed." Leishman looks upon pubeotomy as forming "little more than an episode in the operative midwifery of the past." Parvin devotes less than five lines to the subject, and says, "the American obstetrician will find no condition justifying its performance." Playfair thinks that the risk of the operation itself, and the subsequent ill effects, together contra-indicate it." Barnes says, "Symphyseotomy will probably not make way in practice as an alternative for the Cesarean section or for embryotomy." Lusk entirely ignores the subject.

From this abyss of disrepute and neglect the operation has been rescued by Prof. Morisani, of Naples, who, in 1881, published a report of the work done by Prof. Novi and himself in symphyseotomy. A year later, Dr. Robert P. Harris, of Philadelphia, published a historical paper upon the subject. Little attention was paid to the report of Morisani, or the paper by Harris, but at the meeting of the American Gynecological Society, in September, 1892, Dr. Harris read another paper, entitled "The Remarkable Results of Antiseptic Symphyseotomy," this paper embracing a resume of the work done in this line during the few preceding years. Ten days after the reading of this paper, September 30, the first operation of pubeotomy was performed in this country, by Dr. Chas. Jewett, in Brooklyn. Three days later it was performed at the University Hospital of Philadelphia, and later a considerable number of operations have been performed in this country. The first Canadian operation was made December 5, by Dr. J. A. Sprengle, of Montreal. November 22, the first symphysetomy since 1782 was made in the Rotunda Lying-in Hospital, in Dublin, both mother and child being saved.

INDICATIONS FOR THE OPERATION. — Pubeotomy is applicable in all cases in which the antero-posterior diameter of the pelvis exceeds two and one-half inches, and in which a viable child can not be delivered with safety by the forceps. This excludes cases of hydrocephalus, in

which, of course, craniotomy should be performed. The space gained by pubeotomy is not sufficient to allow of delivery where the conjugate diameter is less than two and one-half inches, and here Cesarean section or craniotomy must be performed. In this country, the flat, rachitic pelvis is the most common cause rendering natural delivery impossible. Dr. J. B. Michael thinks that the operation is indicated in cases of face presentation with the chin toward the sacrum. He has demonstrated the feasibility of the operation by experiments upon the cadaver. It is unquestionable, however, that the most frequent indication will be found in cases of simple disproportion between the size of the fetal head and the dimensions of the pelvis. Thus, in Dr. Broomall's patient, a preceding child had been delivered under version, but was born dead, and the child saved by Dr. Broomall made no advance into the superior strait under a labor of twenty-four hours, with the membranes broken from the commencement. After pubeotomy, the child was delivered in ten minutes with the forceps, and under a very moderate force. From Shrobak's Clinic, in Vienna, a case is reported, in which the child was saved by pubeotomy, in a woman who had been delivered four years previously by Breisky under Cesarean section. The conjugate diameter was three inches. Pinard, of Paris, thinks that pubeotomy is indicated in cases in which the child is dead, but where the contraction of the pelvis is so great as to render embryotomy impossible, or exceedingly dangerous to the mother. In cases of extreme contraction of the pelvis, where the obstetrician is consulted beforehand, it has even been proposed to induce premature labor at eight months, and deliver after pubeotomy. Prof. Morisani reports such a case. His patient was a rachitic dwarf, with a conjugate of two and three-sixteenth inches. Labor was induced in the first week of the eighth month. Under pubeotomy, the fetus was safely delivered. It measured fifteen and three-fourths inches in length, and

weighed four and one-half pounds. The occipito-frontal diameter was three and one-half inches, occipito-mental four and three-fourths inches, bi-parietal three inches, and bi-temporal two and three-eighths inches. The mother and child made a safe recovery. Of course, in cases of ankylosis of the sacro-iliac synchondroses pubeotomy is contra-indicated.

METHOD OF OPERATING.—Sigault performed his first operation with an ordinary long-pointed scalpel, but he cut a crus of the clitoris and wounded the urethra. He subsequently used the probe-pointed bistoury, which was introduced through a short incision above the pubes, passed down behind the symphysis, and the cut made from below upward, and within outward. One or two cases have been reported in which the operator found it necessary to use a saw, owing to lack of strength in the blade of the knife. The knife now in use for this operation is a strong, sickle-curved, probe-pointed bistoury, known as the falsetta of Galbiati, from its inventor, Prof. Cennaro Galbiati, of Naples. The technique of the operation is simple. 1. Thoroughly clean and disinfect the field of operation, including the vagina and abdominal walls, and shave the pubes. 2. Make a short vertical incision in the median line, descending to about three-fourths of an inch above the symphysis, separating the recti muscles. 3. Pass the fore finger of the left hand back of the symphysis to its lower border, pushing away the tissues. Using this finger as a guide, pass the curved knife of Galbiati until its tip projects below and in front of the symphysis. The cut is then made upward and outward. To avoid any possible injury to the urethra, an assistant should hold it a little to the right by means of a metal catheter, while the knife is placed a little to the left. 4. As soon as the joint is opened, the wound should be covered with antiseptic gauze, and the child delivered either with forceps or by the natural forces, as the operator thinks best. The trochanters should be supported by assistants during the passage of the child,

so as to avoid unnecessary strain on the sacro-iliac joints. 5. As soon as the delivery is completed, the wound should be sewed up, with or without drainage, as needed. The lowest stitch may be made to pass through the fibrous tissues at the top of the symphysis. Adhesive strips and a snug bandage should be placed around the entire pelvis. Immediately after the operation the joint opens freely, and during the delivery of the child gapes to the extent of two and a half to three inches as the maximum. This increases the length of the conjugate, according to Morisani, by about half an inch. A separation of three inches at the symphysis causes a separation at the sacro-iliac synchondrosis of only three-sixteenth of an inch, which produces no injury at that point. Hemorrhage, if the operation is properly performed, amounts to nothing. In case it should, for any reason, be excessive, it can be controlled by pressure.

Pinard's method of operating is somewhat different from that of Morisani. He makes a free median incision about three inches long, stopping immediately above the clitoris. He then separates the recti muscles, and pushes the index finger into the pre-vesical cavity in order to protect the bladder by its dorsal aspect. He then divides the symphysis from above downward and before backward. In doing this, he cuts through all the fibers of the subpubic ligament, the index finger in the pre-vesical cavity being the guide from the time that the probe point of the bistoury strikes it above until the last fibers of the subpubic ligament are divided. Before this ligament is divided, he takes the precaution to introduce a sound into the urethra, so as to push it downward and laterally out of the way of injury. He then attacks the ligament "by small cuts, as if cutting it fiber by fiber."

After the delivery of the placenta the symphysis is brought together; four deep and four superficial sutures are used, and left in for eight days. An ordinary binder, very firm on the pelvic region, or a plaster bandage, should then be applied.

RESULTS OF THE OPERATION.—Dr. Robt. P. Harris, of Philadelphia, to whom the profession is deeply indebted for his statistical work on Cesarean section and pubeotomy, had collected, up to last December, fifty-six cases of pubeotomy since January 1, 1886; that is, fifty-six operations had been made under modern methods of surgical work. Of these fifty-six, one woman died. In the fifty-five that did not die, recovery was complete and without disability. Of the fifty-six children, one was dead when delivered; seven others died within three days, leaving forty-eight that were saved. The woman that died had been in labor several days. There was a shoulder presentation with the cord prolapsed, but beating feebly. The symphysis was opened and the child turned and delivered, deeply asphyxiated. The woman died twelve days later with metro-peritonitis, the result of the manipulations practiced before she was brought to the hospital where the operation was performed. Pinard, of Paris, has reported seventeen symphyseotomies without the loss of a single mother, all the children being born alive.

In mentioning the indications for the operation, I said that under two and a half inches antero-posterior diameter the choice must lie between Cesarean section and craniotomy. Personally, I believe that craniotomy on a viable fetus is unjustifiable, and that the operator who, dreading to destroy the living fetus, waits until the fetus dies before performing craniotomy, is simply a cowardly sneak. The responsibility of the death of the fetus can not be thus shifted, and the operator not only kills the child by failing to save it, but increases the hazard to the mother by delaying to perform craniotomy, if he has decided that craniotomy is inevitable. While accomplished obstetricians may agree with Prof. Isaac Taylor, that craniotomy is practicable where the conjugate diameter exceeds one and one-half inches, for the ordinary obstetrician I believe that two and one-half inches should be adopted as the minimum for craniotomy, and with this minimum, Perry, in the *Ameri-*

can Journal of Medical Science, has shown that the results of craniotomy are not as good as those of Cesarean section. It is to be hoped that the day is rapidly approaching, if it is not already here, when craniotomy upon the viable fetus will not be tolerated by either professional or public opinion.

Apropos of the present revival of symphyseotomy, Segault, the father of symphyseotomy, in a discourse published in Paris, in 1778, used these words: "Without doubt time and success will avenge me; why should I be more fortunate than so many others who have had the happiness to make discoveries important to humanity? They have been persecuted during life, and posterity has worshiped at their tomb."

OBITUARY.

DR. A. N. WYLIE.

In the death of Dr. A. N. Wylie, which occurred on the morning of December 14, our community lost one of its most grand and remarkable characters. For three-quarters of a century, as boy and man, he has been identified with the people of Ripley. There are only one or two persons now living who have resided here so long. Although he never sought notoriety, his eminent ability, professional prominence and social characteristics made him one of the most conspicuous of our professional men. He was never demonstrative. There was no shallow, muddy babbling in his nature, but the purity and power of the great irresistible current. Every word and act bore a decided meaning, the intent and sincerity of which could not be doubted. He was no diplomat, no schemer. Intrigue was as foreign to his nature as the darkness of the caverns is to the sunlight. He was fearless as a lion, yet gentle and kind as the tenderest woman. When occasion required, his vigorous, but deliberate condemnation of wrong was withering in its power. Even a look from his expressive eye was a rebuke which few men would dare encounter more than once. With all this, he was a most popular man and pleasant companion.

To refer to Dr. Wylie's intellectual and scholastic worth, would be to reiterate the comments of all our citizens. The same is true as to his quiet liberality. Though his

left hand knew not what the right hand did, and the doctor never whispered his good works to the nearest friend, there are many who have reason to bless his memory for substantial aid in their hour of need. No cry of an anguished heart failed of response from his sensitive soul.

The doctor was not a member of any church, a fact probably due an aversion upon his part to subscribing to any creed which he could not endorse to its minutest details. He was a deep and independent thinker, accepting no other man's conclusions as final. He had always been an attendant upon and a warm friend of the Methodist Church, to the support of which he was a quiet but generous contributor. No member of any church could have been more scrupulously honest and honorable in all his relations, and none freer from reproach in the sight of God and man.

During his last illness he frequently expressed a calm resignation to the result which his professional knowledge assured him was not far distant. He was a most patient sufferer, full of the kindest consideration for others, even when the most excruciating tortures of disease were racking his own system. He expressed a full belief in the existence of God, and an intelligent, cheerful faith in Christ as the Savior of mankind. There may be creeds which would shut the gates of heaven against such a man, but we can not conceive of such an act of a godlike God.

Dr. Wylie was a native of Pennsylvania, having been born in Washington, Washington County, the 27th of January, 1813. His parents removed to this place in 1818, where his father, Dr. Adam Wylie, practiced medicine until his death in 1839.

Dr. A. N. Wylie was a graduate of the old Ripley College, a prominent institution of its day. He was also a graduate, with high honors, from the Transylvania Medical University of Lexington, Ky., and from the Jefferson Medical Institute of Philadelphia. His professional education was supplemented by extensive reading, deep research of

thought, and most thorough acquaintance with progressive medical literature. The esteem and confidence in which the people held him was attested by his immense practice.

In 1856 Dr. Wylie and Miss Lizzie Pangburn were married. She was a refined and cultured lady, whose many excellent qualities and sweet disposition made her a most excellent and lovable companion. Their happy married life was ended by the hand of death, after a period of six years. The deep grief which entered his heart then never left it. Her memory was one of the tender, constant, sacred elements of his life.

He has not, for many years, been rugged in health, and most of the time for the past four or five years has been confined to his home. Skilled and constant medical care, supplemented by his own watchfulness and the most gentle and faithful nursing, have prolonged his years, even beyond his own expectation. He might have lingered with loving friends still longer, had not the grip added its terrors to the disease already besieging the citadel of life. When, at at last, the summons came, his death was apparently painless. He fell asleep without a struggle.

DR. J. S. CUNNINGHAM.

Dr. J. S. Cunningham was born in Ellwood, Lawrence County, Pa., February 4, 1833, and died April 4, 1893, at his home, 237 Wick Avenue, Youngstown, O.

Before studying medicine he taught school and attended Poland Academy for a few years, and later studied in Alleghany College, at Meadville, Pa.

His medical studies were begun at the Cleveland Medical College, and he graduated from Jefferson College in 1860. He commenced practice in Plaingrove, Pa., and in 1862 came to Youngstown, O., where, with the exception of two years' residence at Marietta, O., he assiduously practiced until the time of his last illness.

Dr. Cunningham was an exemplary physician, a man of sterling integrity, and perfection in professional courtesy. Many young doctors were aided in counsel by him, and he was always counted one of the best professional friends to a young practitioner. He was very popular and took great interest in municipal affairs. His official positions were coroner, jail physician, member of the Board of Health, and member of the Board of Education. This last position he held for sixteen years.

Universal regret was manifest throughout the city for the death of this good man, whose friends were legion.

The Mahoning County Medical Society, of which he was a charter member, held a special meeting for the purpose of drafting the following resolutions:

WHEREAS, We have lost one of our number who assisted in organizing our society, and who cheerfully and constantly sustained it to the time of his death; therefore,

Resolved, That it is our desire and duty to express to his family and our fellow-citizens our respect for him, and our appreciation of his many good qualities as physician and citizen.

Resolved, That in our late fellow-worker, we recognize the value of his example in taking an active interest in all that pertains to both local and national affairs; his efforts being for all that was honest, progressive and elevating, and who did cheerfully and promptly his share of the imposed work, serving on the Board of Education for sixteen years, on the health board and numerous city and county committees, without money and without price, in addition to his having served his country for thirty years as a cheerful and conscientious physician.

Resolved, That as a member of the Mahoning County Medical Society, his example was praiseworthy, being ready when his name was reached on its roster to respond by a well-prepared paper, or report carefully-selected cases.

Resolved, We feel our society has maintained a severe loss, our community an exemplary, useful member, and his family a good husband and affectionate father.

Resolved, That these resolutions be made a permanent part of our society's history, and a copy be presented to his family, and that they be published in our city papers.

R. E. WHELAN,
Secretary Mahoning County Medical Society.

DR. GEO. L. THORN.

WHEREAS, We have heard with sincere sorrow of the death of Dr. Geo. L. Thorn, an honored member of the North-western Ohio Medical Association;

Resolved, That we, as an association, extend to his father and family our earnest sympathy; that we have lost a valuable member, our profession a bright and promising surgeon, and society a brilliant ornament.

DR. F. D. BAIN, Kenton.

In seconding the resolution just offered I can not allow the opportunity to pass without saying something more than is contained in these formal words.

It was not my good fortune to know Dr. Geo. L. Thorn intimately or for a long time; but my brief acquaintance made me feel that I had known him, and known him well, for years. Only a few weeks before his death he, in company with his sister, was a visitor at my home. At a society gathering he met many of the best young people of our city, and the exquisite charm and grace of his manner readily won all hearts, and the news of his untimely death has cast a gloom over society in Fremont, which has not yet been effaced.

His honored father, who is with us to-day, together with his mother and sisters, I am sure have the heartfelt sympathy of the members of North-western Ohio Medical Association.

DR. WM. CALDWELL, Fremont, Ohio.

Adopted at Kenton, Ohio, May 12, 1893.

DR. GEORGE W. GALLOWAY.

Dr. George W. Galloway was born in Findlay, Ohio, September 6, 1846. He read medicine at different times with Dr. A. Hurd and Dr. F. W. Entrikin in this city, graduating when twenty-three years of age from the Western Reserve Medical College, having previously pursued his studies at the University of Michigan. The degree of A. M. was conferred upon him in 1880, by the University of Wooster.

Dr. Galloway began the practice of medicine at Mt. Blanchard, Ohio, where he remained one year, removing to Shawnee, Kansas, and afterward to Fort Collins, and Trinidad, Col.

In 1886 he returned to Findlay, Ohio, where he remained in active practice until his death, January 30, 1893, from a complication of diseases involving the heart and kidneys.

Dr. Galloway was one of the organizers and the first president of the Hancock County Medical Society, using his influence at all times to the best interest of the society. He was also an active member of the State and National societies.

As a man he was esteemed and honored by all who knew him. As a physician he occupied a high position in the city, and his death will be lamented by a wide circle of loving families.

WHEREAS, By the death of Dr. Geo. W. Galloway, the Hancock County Medical Society has lost one of its founders and first president; and,

WHEREAS, One of the members of this committee remember him as an associate student for three years and a graduating classmate, and another as a preceptor for the same time, and both take pleasure in bearing testimony to his gentlemanly bearing and general integrity, as well as to his persevering and persistent energy in researches connected with his chosen profession; therefore, be it

Resolved, That in our departed colleague we have lost a member of the strictest professional integrity and courtesy; a man of broad culture as well as a skillful physician, as is verified by the many to whom he had given physical relief during a busy and useful life.

Resolved, That this society severally and unitedly tender their condolence to the family and many friends of the deceased.

Resolved, That a copy of these resolutions be presented to the family, and also spread on the minutes of the society.

Very respectfully,

J. P. BAKER, M. D.,
Secretary Hancock County Medical Society.

DR. HIRAM ECKMAN.

WHEREAS, It has pleased Almighty God to remove from our midst Hiram Eckman, M. D., late of Tuscarawas, Ohio, a valued member of this society; be it

Resolved, That we, the members of the Tuscarawas County Medical Society, while bowing in humble submission to the will of Him who rules all, express our deep sorrow at the death of our friend and co-laborer; and,

Resolved, That while we recognized in him a model man of integrity, and untiring in his labor to advance the knowledge of medical science, one who was ever ready in the hour of need to relieve the afflicted, many of whom have attested the value of his services and now lament with us his removal from earth; therefore, be it

Resolved, That we most respectfully tender to the bereaved wife and family our heartfelt sympathy in their bereavement; and, be it further

Resolved, That a copy of these resolutions be sent to the bereaved family, and that they be published in the county papers, and that they be spread on the minutes of the society.

J. E. GROVES, *President.*

J. A. MCCOLLAM, *Secretary.*

· · · MEMBERS · · ·

OF THE

OHIO STATE MEDICAL SOCIETY

Capitalized: thirty-year members.
Italicized: deceased since last meeting.
Local Secretaries and members will please notify the Secretary of errors and omissions, and forward obituary notices with their annual reports.
Annual reports due in March.

THOS. HUBBARD, *Secretary.*

Adams, P. N., Dayton, Montgomery Co. Medical Society.....1885
Alcorn, A. W., Ravenna.....1870
Allen, D. B., West Liberty (Logan Co.), resigned.....1865
Allen, Dudley P., Cleveland, Cuyahoga Co. Medical Society....1885
Allen, Harlan P., Columbus, Central Ohio Medical Society.....1884
Andre, O. C., Piketon (Pike Co.).....1888
Axline, C. Z., Fultonham, Hildreth District Medical Society....1884
Ayres, S. C., Cincinnati, Academy of Medicine.....1877
Baker, A. R., Cleveland, Cuyahoga Co. Medical Society.....1886
Baker, J. P., Findlay, Hancock Co. Medical Society.....1891
Baker, W. O., Louisville (Stark Co.), Union Med. Ass'n N. E. O..1882
Baldwin, J. F., Columbus, Central Ohio Medical Society.....1875
Ballinger, J. B., Webster.....1880
Barnes, T. S., Chillicothe, Ross Co. Medical Society.....1890
Barnes, W. T., Fredericksburg (Wayne Co.), Union M. A. N. E. O.1891
Barnhill, J. W., Columbus, Central Ohio Medical Society.....1884
Barrere, D. M., Dayton, Montgomery Co. Medical Society..... 1884
Barton, T. J., Zanesville.....1881
Bates, F. L., Lima, Allen Co. Medical Society.....1890
BATTLES, W. S., Shreve, North Central Ohio Medical Society...1858
Bauer, M. M., Lake, Union Med. Ass'n N. E. O.....1884
BEACH, J. N., W. Jefferson (Madison Co.), Cen. O. Med. Society .1854
Beach, T. D., Catawba (Clarke Co.).....1884
Beardsley, C. E., Ottawa (Putnam Co.), N. E. O. Med. Ass'n.....1869
Beck, J. S., Dayton, Montgomery Co. Medical Society.....1879

Beers, A. M., Newcomerstown, Tuscarawas Co. Medical Society. 1882
Benner, C. T., Tiffin, North-western Ohio Medical Association.. 1891
Bennett, W. C., Iberia (Morrow Co.) 1891
Bessey, J. Mortimer, Toledo, Toledo Medical Association..... 1887
Blair, Jas. F., Linwood (Hamilton Co.)..... 1884
Blake, W. H., Shadeville (Franklin Co.), Cen. O. Med. Society.. 1878
Bleile, A. M., Columbus..... 1882
Boerstler, G. W., Lancaster (Fairfield Co.) 1870
Bonner, Horace, Dayton, Montgomery Co. Medical Society..... 1890
Boone, D. W., Bellaire, Belmont Co. Medical Society..... 1890
Bowen, A. H., Columbus, Central Ohio Medical Society..... 1878
Boylan, A., Milford Center, (Union Co.)..... 1878
Bramble, D. D., Cincinnati..... 1870
Brannan, T. H., Canal Dover, Tuscarawas Co. Medical Society.. 1884
Brashear, B. B., Cleveland, Cuyahoga Co. Medical Society..... 1886
BRICKER, W. R., Shelby, (Richland Co.). 1848
BRINKERHOFF, D. H., Fremont, N. W. O. Med. Ass'n..... 1853
Brockett, A. J., Cleveland..... 1874
Brown, H. H., Lyons (Fulton Co.), N. W. O. Med. Ass'n..... 1887
Brown, H. M., Hillsboro, Highland Co. Medical Society..... 1882
Brown, J. A., Germantown (Montgomery Co.)..... 1886
Brown, Warren B., San Luis Obispo, California..... 1888
Brush, E. C., Zanesville, Hildreth District Medical Association. 1878
Buckingham, John M., Springfield, Clarke Co. Medical Society. 1885
BUCKNER, J. H., Cincinnati, Academy of Medicine..... 1863
Buechner, W. L., Youngstown, Mahoning Co. Medical Society.. 1879
Bunce, W. C., Oberlin, North Cental Ohio Medical Association. 1891
Bunn, J. W., West Union, Adams Co. Medical Society 1872
Butler, G. O., Cleveland..... 1870
Butler, G. W., Columbus... 1869
Caldwell, Wm., Fremont, North-western Ohio Med. Ass'n..... 1886
Caldwell, W. W., Hamilton..... 1874
Calvin, J. H., Huron, Erie Co. Medical Society..... 1891
Campbell, John, Galion, Crawford Co. Medical Society..... 1891
Campbell, W. A., Eaton (Preble Co.), removed..... 1888
Carmichael, W. A., Loveland, Clermont Co. Medical Society.... 1871
Carpenter, Julia W., Cincinnati, Academy of Medicine..... 1879
Carrick, A. L., Cincinnati..... 1871
Case, F. D., Ashtabula, Ashtabula Co. Medical Society..... 1886
Chamberlin, D. P., Toledo, Toledo Medical Association..... 1874
Chaney, H. L., Columbus..... 1886
Chapman, Byron, Copley, U. M. A. N. E. O..... 1885
Chapman, W. C., Toledo, Toledo Medical Association..... 1875

Clark, C. F., Columbus, Central Ohio Medical Society.....1885
Clark, John H., Mechanicsburg (Carroll Co.).....1869
Clark, M. S., Youngstown.....1879
Clark, Ida, Youngstown, Mahoning Co. Medical Society.....1889
Cobb, Chas., New Athens.....1889
Coleman, N. R., Columbus.....1875
Collamore, Geo. A., Toledo, Toledo Medical Association.....1880
Collins, M. H., South Charleston, Clarke Co. Medical Society..1890
Colville, G. H., Harrisville (Harrison Co.).....1887
Conklin, W. J., Dayton, Montgomery Co. Medical Society.....1868
Conn, Eli, Akron, Union Medical Association, N. E. Ohio.....1887
Conner, P. S., Cincinnati, Academy of Medicine.....1868
Cook, G. F., Oxford, Butler Co. Medical Society.....1885
Cooper, A., Columbus, Central Ohio Medical Association.....1881
Corlett, W. T., Cleveland, Cuyahoga Co. Medical Society.....1882
Carson, O. M., Middletown, Butler Co. Medical Society.....1879
COTTON, J. D., Marietta, Washington Co. Medical Society.....1852
Courtwright, A. P., Circleville (Pickaway Co.).....1871
Courtwright, G. S., Lithopolis (Fairfield Co.).....1867
Cox, J. M., South Salem, Ross Co. Medical Society.....1877
Craig, J. Harvey, Mansfield, North Central Ohio Med. Society..1886
Craig, J. W., Mansfield, North Central Ohio Medical Society....1874
Crane, A. M., Marion, Marion Co. Medical Society.....1881
Crossland, J. C., Zanesville.....1890
CUSHING, H. K., Cleveland, Cuyahoga Co. Medical Society.....1857
Cullen, G. I., Cincinnati, Academy of Medicine..... 1890
Dandridge, N. P., Cincinnati, Academy of Medicine.....1871
Davidson, N. P., Hilliard (Franklin Co.).....1890
Davison, Jno. F., North Amherst (Loraine Co.), N. O. M. S.....1893
Davis, W. B., Cincinnati, Academy of Medicine.....1865
Dawson, W. W., Cincinnati, Academy of Medicine. 1853
Denman, W. C., Marion, Marion Co. Medical Society,.....1882
DeVilbiss, Allen, Toledo, Toledo Medical Association.....1887
Dickey, Thomas A., Middletown, Butler Co. Medical Society....1879
Dine, C. L., Minster, Shelby Co. Medical Society.....1893
Dixon, W. A., Ripley, Brown Co. Medical Society.....1889
Donnellan, J. E., Germantown, Montgomery Co. Med. Society..1879
Dorman, H. W., Harbor, Ashtabula Co. Medical Society.....1886
Downs S., Waterville (Lucas Co.).....1876
Duncan, A. M., Bucyrus, Crawford Co. Medical Society.....1886
Duncan, Jas. A., Toledo, Toledo Medical Association.....1874
DUNLAP, ALEX., Springfield.....1854
Dunlap, C. O., McArthur (Vinton Co.) 1881

Dunlap, C. W., Springfield.....1869
Dutton, C. F., Cleveland, Cuyahoga Co. Medical Society.....1880
Dwyer, R. A., New Petersburg, Highland Co. Medical Society..1879
Eckman, Hiram, Tuscarawas.....1869
Eddy, C. W., Marietta, Washington Co. Medical Society.....1888
Eichberg, Jos., Cincinnati, Academy of Medicine.....1882
Elster, L. A., Jeffersonville (Fayette Co.), withdrawn.....1884
Ervin, N. B., Gibsonburg, Sandusky Co. Medical Society. 1891
Evans, A. E., Columbus, Central Ohio Medical Society.....1882
Everett, Abner B., Kipton (Loraine Co.).....1893
Everts, Orpheus, College Hill, Cincinnat, Acad. of Medicine...1885
Fackler, J. E., Versailles (Darke Co.) 1879
Fassig, J. M., Zanesville, Muskingum Co. Med. Society.....1893
Ferrell, C. B., Columbus 1878
Finley, W. H., Spring Valley, Greene Co. Medical Society.....1890
Fitzpatrick, T. V., Cincinnati, Academy of Medicine.....1890
Flemming, Ellis, Wingett Run, Washington Co. Med. Society..1889
Floyd, J. C. M., Steubenville, Jefferson Co. Medical Society.....1884
Follett, Alfred, Granville, Licking Co. Medical Society.....1864
FORBES, S. F., Toledo, Toledo Medical Association.....1856
Foster, G. F., Kingston Center (Ross Co.).....1882
Foster, C. A., Washington C. H., Fayette Co. Medical Society..1891
Fowler, S. W., Delaware.....1873
FULLER, S. W., Bellefontaine.....1853
Gale, C. Bernard, Newport (Washington Co.).....1886
Gale, G. T., Newport, Washington Co. Medical Society.....1888
Galloway, C. M., Xenia, Greene Co. Medical Society.....1888
Galloway, W. A., Xenia, Greene Co. Medical Society.....1890
Gaune, A. J., Sandusky, Erie Co. Medical Society.....1870
GAY, N., Columbus, Cent. Ohio Medical Society.....1848
Gibbon, H. B., Tiffin, N. W. Ohio Medical Assocation.....1891
Gibson, Robt. D., Youngstown, Mahoning Co. Med. Soc.....1882
Gillespie, J. M., Bloomingburg, Fayette Co. Med. Society.....1880
Gilliam, D. Tod, Columbus,.....1873
Gilliam, E. M., Columbus, Cent. Ohio Medical Society.....1890
Goodhue, Geo., Dayton, Montgomery Co. Med. Society.....1884
Goodson, J. W., Sterling (Kansas).....1874
GORDON, T. W., Georgetown, Brown Co. Medical Society.....1849
Goss, J. H., Lancaster (Fairfield Co.).....1884
Graefe, Chas., Sandusky, Erie Co. Med. Society.....1891
Graefe, Wm., Saudusky, Erie Co. Med. Society.....1874
Granger, B. D., Russells, Highland Co. Medical Society.....1874
Granger, F. M., Russells, Highland Co. Medical Society.....1881

Green, H. S., Cardington (Morrow Co.).....1878
Greene, D. W., Dayton, Montgomery Co. Medical Society.....1882
Griswold, E. Sharon (Pa.).....1889
Groves, J. E., Uhricksville, Tuscarawas Co. Med. Society.....1884
Guerin, L. T., Columbus, Columbus Medical Club.....1888
Guerin, Z. F., Columbus, Central Ohio Medical Society.....1884
Guittard, A. M., Killbuck, Holmes County Medical Society.....1886
Guittard, F. J., Killbuck, Holmes Co. Medical Society.....1875
Haldesman, J. S., Zanesville, Hildreth Dist. Med. Association...1885
Hall, R. B., Cincinnati, Academy of Medicine.....1884
Hall, W. W., Springfield, Clarke Co. Medical Society.....1882
Hamilton, C. S., Columbus, Central Ohio Medical Society.....1891
HAMILTON, J. W., Columbus, Central Ohio Medical Society.....1849
Hamilton, Wm. D , Columbus, Central Ohio Medical Society...1886
Hamilton, H. A., Perrysburg, North-western Ohio Med. Ass'n..1886
Hardy, J. M., Whipple, Washington Co. Medical Society.....1886
HARMON, JULIAN, Warren, Trumbull Co. Medical Society.....1857
Harrison, E. B., Napoleon, N. W. Ohio Medical Association....1869
HART, B. F., Marietta, ...1854
Hart, Samuel, Marietta, Washington Co. Medical Society.....1887
Hartman, G. W., Archibald, N. W. Ohio Med. Association.....1887
Hartman, S. D., Tippecanoe City, Miami Co. Med. Society.....1874
Hasencamp, O., Toledo, Toledo Medical Association.....1891
Hathaway, H., Toledo, Toledo Medical Association.....1874
Haynes, J. T., Sandusky.....1893
Hatch, Chas. A., Newark.....1893
Heistand, E. B., Kenton, N. W. Ohio Med. Association.....1884
Heiter, Carl, Sandusky, Erie Co. Medical Society.....1875
Helmick, G. W., Harrisburg (Franklin Co.).....1878
HENDERSON, D. W., Marysville (Union Co.).....1856
Hendrickson, Hugh, Columbus, Central Ohio Med. Society.....1868
Herrick, H. J., Cleveland, Cuyahoga Co. Medical Society.....1868
Hiddleson, C. S., Atwater, Portage Co. Medical Society.....1888
Hill, N. S., Neville, Clermont Co. Medical Society.....1866
Hillbish, F. S., Fremont.....1878
Himes, Isaac N., Cleveland, Cuyahoga Co. Medical Society.....1877
Hinckley, H. D., Oxford, Butler Co. Medical Society.....1887
Hiner, S. B., Lima, Allen Co. Medical Society.....1874
Hines, J. A., VanWert.....1879
Hipple, J. R., Waldo (Marion Co.).....1881
Hise, A. H., New Washington.....1890
Hixon, M. M., Dupont, North-western Ohio Medical Ass'n.....1887
Hobbs, W. A., East Liverpool (Trumbull Co.).....1889

Hobson, J. A., Flushing, Belmont Co. Medical Society.....1891
Hoff, J. W., Pomeroy, Meigs Co. Medical Society.....1872
Holliday, B. W., Cleveland, Cuyahoga Co. Medical Society.....1875
Hoover, C. M., Alliance (Stark Co.).....1885
Hough, C. A., Lebanon, Warren Co. Medical Society.....1890
Hough, W. S:. Cuyahoga Falls, Union Med. Ass'n, N. E. O.....1875
House, A. F., Cleveland.....1880
Hubbard, Thomas, Toledo, Toledo Medical Association.....1889
Humbert, Frank, Mt. Liberty (Knox Co.).....1890
Humiston, W. H., Cleveland, Cuyahoga Co. Medical Society....1880
Hurd, A., Findlay, Hancock Co. Medical Society.....1870
HYATT, E. H., Delaware, Central Ohio Medical Society.....1862
Iddings, A. H., Dayton.....1879
Ikirt, G. P., East Liverpool (Champaign Co.).....1882
Ireland, W. E., Washington C. H., Fayette Co. Medical Society.1887
James, A. D., Mt. Gilead (Morrow Co.).....1891
Jennings, E., Dayton, Montgomery Co. Medical Society.....1867
Jewett, H. S., Dayton, Montgomery Co. Medical Society.....1871
Johnson, O., Worthington, Central Ohio Medical Society.....1878
Jones, Jno. D., Cincinnati.....1887
Jones, J. D., Newburg, Cuyahoga Co. Medical Society.....1870
JONES, R. E., Gomer, North-western Ohio Med. Association...1863
Jones, Toland, London.....1878
JONES, T. W., Columbus, Central Ohio Medical Society.....1847
Judkins, C. P., Cincinnati.....1887
KAY, ISAAC, Springfield, Clarke Co. Medical Society.....1853
Keller, B. T., Bloomingburg, Fayette Co. Medical Society.....1891
Keller, Thos. F., New Washington (Crawford Co.).....1887
Kelly, H. R., Galion.....1868
Kelly, W. J., Galion, Crawford Co. Medical Society.....1881
Kendig, W. C., Hayesville, Ashland Co. Medical Society.....1874
King, Jno. I., Burgh Hill, Trumbull Co. Medical Society.....1884
Kinsman, D. N., Columbus, Central Ohio Medical Society.....1864
Kirkley, C. A., Toledo, Toledo Medical Association.....1874
Krause, B., Cleveland, Cuyahoga Co. Medical Society.....1880
Kreiger, G. L., Madisonville, Warren Co. Medical Society.....1884
Kurz, C. E., Bellaire, Belmont Co. Medical Society.....1875
LANDON, C. P., Westerville, Central Ohio Medical Society.....1851
Larimore, F. C., Mt. Vernon, North Central Medical Society...1871
Lash, H. M., Indianapolis (Ind.).....1879
Lash, J. M., Chillicothe, Ross Co. Medical Society.....1879
Lathrop, A. B., Swanton, North-western Ohio Med. Ass'n.....1887
Lawless, J. T., Toledo, Toledo Medical Association.....1887

Lawrence, F. F., Columbus, Central Ohio Medical Society.....1888
Leach, S., Mt. Sterling (Madison Co.).....1888
Leahy, Maurice, Tiffin (Seneca Co.).....1891
Lee, E. B., Garrettsville (Portage Co.).....1870
Lefevre, Edw., Sidney (Shelby Co.).....1891
Levan, D. H., Mt. Victory.....1879
LEONARD, B. B., West Liberty, North-western Ohio Med. Ass'n.1854
Leonard, W. W., Delaware.....1891
Leslie, J. M., Chillicothe, Ross Co. Medical Society.....1878
Lewis, W. C., Rushville (Fairfield Co.).....1869
Lightner, S. B., Sabina, Clinton Co. Medical Society.....1888
Love, M. J., Bloomingville (Seneca Co.).....1891
LOVING, S., Columbus, Central Ohio Medical Society.....1858
Lowman, J. H., Cleveland, Cuyahoga Co. Medical Society.....1877
LYMAN, C. N., Wadsworth, U. Med. Ass'n N. E. O.....1852
McClellan, B. R., Xenia, Greene Co. Medical Society.....1888
McClintock, Samuel, Mt. Sterling (Madison Co.).....1890
McClung, John C., Leipsic, North-western Ohio Med. Ass'n....1887
McClure, Jas., Marietta, Washington Co. Medical Society.....1866
McCollum, E. J., Tiffin, North-western Ohio Med. Ass'n.....1871
McCurdy, John, Youngstown, Mahoning Co. Medical Society..1870
McCurdy, S. L., Dennison, Tuscarawas Co. Medical Society....1882
McDowell, John O., Delaware.....1884
McEbright, T., Akron, Summit Co. Medical Society.....1866
McGavran, S. B., Cadiz (Harrison Co.).....1887
McGee, J. B., Cleveland, Cuyahoga Co. Medical Society.....1880
McGlenn, J. A., Mt. Pleasant (Jefferson Co.).....1891
McGrew, Henry, Pleasant Ridge (Hamilton Co.).....1878
MCILHENNY, J. J., Dayton.....1847
McIntyre, W., Warrensburg, Central Ohio Medical Society.....1881
McKee, E. S., Cincinnati.....1886
McKim, F. E., Marietta, Washington Co. Medical Society.....1886
McKinley, E. B., Vaughnsville, N. W. Ohio Med. Ass'n.....1887
McLean, J. T., New Philadelphia, Union Med. Ass'n N. E. O....1884
McMurray, A. B., Marion.....1879
MACK, JOHN, Shelby, Richland Co.....1853
Macready, J., Monroe, Butler Co. Medical Society.....1885
Marquart, O. M., Osborn, Greene Co. Medical Society.....1891
Marshall, S. A., Jeffersonville.....1889
Martin, J. T., Marion, Marion Co. Medical Society.....1884
Matthews, R. C., Columbus, Columbus Medical Club.....1888
Mattoon, F. N., Plain City (Madison Co.).....1881
Merriam, E. D., Conneaut, Ashtabula Co. Medical Society.....1884

Merriman, D. J., Painesville, Geauga Co. Medical Society.....1884
Mertz, Chas. H., Sandusky, Erie Co. Medical Society.....1891
Metzlert A. S., Baltic (Tuscarawas Co.).....1874
Miller, A. T., Shanesville, Tuscarawas Co. Medical Society.....1890
Miller, T. Clarke, Massilon, Union Med. Ass'n N. E. O.....1893
Mills, C. H., Toledo, North-western Ohio Med. Ass'n.....1888
Mills, J. T., Jersey (Licking Co.).....1878
Millikin, B. L., Cleveland, Cuyahoga Co. Medical Society.....1885
Millikin, Dan, Hamilton.....1879
Moore, L. G., Kinsman, Trumbull Co. Medical Society.....1878
Morehouse, G. W., Sparta (Morrow Co.).....1890
MORRIS, JONATHAN, Ironton (Lawrence Co.).....1853
Morris, Joseph, Columbus Grove, N. W. Ohio Med. Ass'n.....1879
Mory, J. J., St. Henrys (Mercer Co.).....1871
Mosgrove, Jas. M., Urbana, Champaign Co. Medical Society....1884
MOUNTS, LEONARD, Morrow, Lebanon Medical Society.....1860
Murbach, A. J., Archibald, North-western Ohio Med. Ass'n.....1874
Murphy, J. A., Cincinnati, Academy of Medicine.....1872
Murray, L. S., Medina, U. Med. Ass'n N. E. O.....1870
Nash, E. K., Montrose, U. Med. Ass'n N. E. O.....1886
Nau; J. G., Carroll (Fairfield Co.).....1878
Neil, Alex., Columbus.....1868
Noble, Chas. D., Oberlin.....1893
Norris, T. B., Alton (Franklin Co.).....1882
North, John, Toledo, Toledo Medical Association.....1891
Nunemaker, H. B., Philadelphia Insane Asylum.....1875
Owsley, J. B., Jacksonburg (Butler Co.).....1871
Overly, J. E., Columbus, Central Ohio Med. Society.....1888
Pake, J. H., Middleport, Meigs Co. Medical Society.....1890
Palmer, C. D., Cincinnati, Academy of Medicine.....1871
Parker, C. B., Cleveland, Cuyahoga Co. Med. Society.....1886
PATTERSON, A. V., Mansfield.....1861
PEARCE, E., Steubenville, Jefferson Co. Medical Society.....1859
Pearce, H. C., Urbana, Champaign Co. Medical Society.....1867
Pearce, Henry M., Urbana, Champaign Co. Medical Society....1890
Peck, G. S., Youngstown, Mahoning Co. Medical Society.....1891
Pennell, W. W., Frederickstown (Knox Co.).....1884
Peter, Robert, Canal Dover, Tuscarawas Co. Med. Society.....1891
Pettitt, R. R., Dayton, Montgomery Co. Medical Society.....1885
Pomerene, P. P., Berlin, Holmes Co. Medical Society.....1870
Potter, Nathaniel, Adelphi (Ross Co.).....1890
Powell, W. S., Defiance.....1881
PRICE, JOSEPH, Randolph, Portage Co. Medical Society.....1852

Quinn, A. T., Wilmington, Clinton Co. Medical Society.....1881
Quirk, H. W., Cleveland, Cuyahoga Co. Medical Society.....1889
Rankin, T. W., Kirkersville, Licking Co. Medical Society.....1881
Ranney, S. W., Hope, Central Ohio Medical Society.....1878
Ransohoff, Jos., Cincinnati, Academy of Medicine.....1879
REAMY, THAD. A., Cincinnati, Academy of Medicine.....1855
Reed, C. A. L., Cincinnati, Academy of Medicine.....1881
Reed, Calvin H., Toledo, Toledo Medical Association.....1873
Reed, R. C. S., Stockton (Butler Co.).....1867
Reed, R. Harvey, Columbus, North Central Ohio Med. Society..1884
REEVE, J. C., Dayton, Montgomery Co. Medical Society... 1861
Reinhart, J. C., Toledo, Toledo Medical Association.....1887
Reinfrank, J. H., Perrysburg, N. W. Ohio Medical Ass'n.....1886
Rhu, Auguste, Marion, Marion Co. Medical Society.....1886
Richardson, A. B., Columbus, Academy of Medicine.....1891
Ricketts, B. M., Cincinnati, Academy of Medicine.....1884
Ricketts, E. Irvin, Cincinnati, Academy of Medicine.....1882
Ridgeway, N. B., Galion (Crawford Co.).....1878
Riggs, J. M., Bryan (Williams Co.).....1873
ROBISON, J. D., Wooster, Wayne Co. Medical Society.....1856
Rodebaugh, H. A., Marysville (Union Co.).....1890
RODGERS, J. H., Springfield, Clarke Co. Medical Society.....1859
Rogers, J. H., Louisville (Stark Co.).....1889
Rosenwasser, M., Cleveland, Cuyahoga Co. Med. Society.....1880
Row, G. T., Circleville.....1881
Rowles, W. T., Columbus, Central Ohio Medical Society.....1888
Russell, E. S., Tuscarawas, Tuscarawas Co. Med. Society.....1880
Ryan, Geo. W., Cincinnati, Academy of Medicine.....1884
Sabin, Thomas, Warren, Trumbull Co. Medical Society.....1893
Sager, J., Celina, N. W. Ohio Medical Association.....1882
Santee, Leon B., Marlboro (Starke Co.) 1885
Sattler, Robert, Cincinnati, Academy of Medicine.....1872
Saxton, O. H., Washington C. H., Fayette Co. Med. Society....1884
Schiller, A. W., Greenford, Mahoning Co. Medical Society.....1890
Schueller, J. B., Columbus.....1869
Schnetzler, H. M., Toledo, Toledo Medical Association.....1874
Schwan, F. W., Tiffin (Crawford Co.) 1880
Scott, W. A., Swanton (Fulton Co.).....1878
SCOTT, W. J., Cleveland, Cuyahoga Co. Medical Society.....1855
Scott, Xen. C., Cleveland, Union M. A. N. E. O.....1874
SCOVILLE, S. S., Lebanon, Warren Co. Medical Society 1859
Seely, W. W., Cincinnati, Academy of Medicine.....1871
Shallioll, R., Winesburg, Holmes Co. Medical Society.....1891

Sharp, B. M , Sidney, Shelby Co. Medical Society.....1885
Sharp, H. J., London (Madison Co.).....1882
Sheldon, S. B., Five Mile, Brown Co. Medical Society.....1882
Sherrard, A. C., Paulding, North-western Ohio Medical Ass'n..1887
Silver, D. R., Sidney, Shelby Co. Medical Society.....1870
SINNETT, E., Granville, Licking Co. Medical Society.....1850
Sisler, L. E., Akron, Union Medical Association N. E. Ohio....1887
Slocum, C. E., Defiance.....1874
Smith, C. N., Toledo, Toledo Medical Association.....1887
Smith, D. B., Cleveland, Cuyahoga Co. Medical Society.....1870
Smith, J. M., New Philadelphia, Tuscarawas Co. Med. Society..1884
Smith, Wm. G., Ravenna, U. M. A. N. E. Ohio. 1888
Snodgrass, J., Kenton, N. W. Ohio Medical Association.....1878
SNYDER, D. J., Scio (Harrison Co.).....1850
Snyder, S. P., New Bedford (Coshocton Co.).....1882
Souders, Samuel, Dean (Montgomery Co.).....1879
Southard, J. Q., Marysville (Union Co.).....1882
Spence, J. A., Wellsville 1888
Spencer, E. R., Doylestown (Wayne Co.)..... 1885
Sperry, W., Tallmadge, Union Medical Association, N. E. Ohio.1886
Stamm, M., Fremont, Sandusky Co. Medical Society.....1891
Stanley, E., Sandusky, Erie Co. Medical Society.....1870
Stansell, J. A., Forest (Hardin Co.)..... 1866
Stein, G. S., Columbus, Central Ohio Medical Society.....1888
Steiner, D. W., Lima, Allen Co. Medical Society.....1890
Stephens, A. H., Eaton (Preble Co.).....1884
STEVENS, E. B., Lebanon, Warren Co. Medical Society.....1853
Stevens, Ed. S., Cincinnati, Academy of Medicine.....1886
Stevens, M. B., Defiance, N. W. Ohio Medical Association.....1887
Stewart, T. H., Church Hill, Trumbull Co. Medical Society....1877
Stewart, W. D., Toledo, Toledo Medical Association.....1887
STILLWELL, THOS., Fremont, Sandusky Co. Medical Society...1857
STOCKSTILL, J. N., New Carlisle (Clarke Co.).....1857
Storey, Wm., Castalia, Erie Co. Medical Society.....1884
SWENEY, R. L., Marion.....1859
Szendery, L. S., Castroville, Medina Co., Texas 1887
Taylor, H. L., Cincinnati.....1888
Taylor, W. H., Cincinnati, Academy of Medicine.....1874
Telfair, Geo. M., Bloomington, Clinton Co. Medical Society....1884
Thomas, F. W., Marion, Marion Co. Medical Society.....1884
Thompson, A. W., Circleville.....1890
Thorn, E. I., Salt Lake City, Utah..... 1878
Thorn, S. S., Toledo, Toledo Medical Association.....1873

Thrasher, A. B., Cincinnati, Academy of Medicine. 1876
Tichenor, E. J., Warren Co. Medical Society 1869
Titus, A., Portsmouth (Scioto Co.). 1888
Tobey, H. A., Toledo, Toledo Medical Ass'n 1878
Tressel, J. H., Alliance, Union M. A. N. E. O 1889
Trimble, R. T., New Vienna, Clinton Co. Medical Society 1881
Tuckerman, L. B., Cleveland, Cuyahoga Co. Medical Society 1891
Upson, Henry S., Cleveland, Cuyahoga Co. Medical Society 1888
Vail, J. B., Lima, Allen Co. Medical Society 1885
Vance, R. A., Cleveland, Cuyahoga Co. Medical Society 1881
Vanderwort, J. W., Harveysburg (Warren Co.) 1864
VANNATA, E., Fultonham (Muskingum Co.) 1855
VanPelt, C. L., Toledo, Toledo Medical Ass'n 1887
VanWinkle, N. B., Blanchester, Clinton Co. Med. Society 1885
Vigor, F. A., Good Hope 1884
VonKlein, C. H., Cleveland 1891
Wagenhals, F., Columbus, Columbus Medical Club 1885
Waggoner, Jos., Ravenna, U. M. A. N. E. O 1870
Walker, A. B., Canton, U. M. A. N. E. O 1882
Ward, C. L., Cridersville, N. W. Ohio Medical Ass'n 1891
Ward, C. S., Warren, Trumbull Co. Medical Society 1875
Ward, W. A., Conneaut, Ashtabula Co. Medical Society 1880
Warner, Frank, Columbus, Central Ohio Medical Society 1884
Weaver, J. M., Dayton, Montgomery Co. Medical Society 1865
Webster, J. B., Flushing, Belmont Co. Medical Society 1890
Weed, T. A., Cleveland 1880
Weeks, O. W., Marion, Marion Co. Medical Society 1884
Welch, A. J., Mt. Sterling (Madison Co.) 1890
West, T. J., Tiffin, N. W. Ohio Medical Ass'n 1875
White, G. M., Columbus, Columbus Medical Club 1888
White, Horace N., Delaware 1887
Whittaker, J. T., Cincinnati, Academy of Medicine 1871
Wilkins, John A., Delta, N. W. Ohio Medical Ass'n 1874
Williams, B. O., Martin's Ferry, Belmont Co. Med. Society 1891
Williams, J. L., Delaware 1878
Williams, T. B., Cleveland 1864
Williamson, M. S., Findlay, Hancock Co. Medical Society 1891
Williard, G. Q., Tiffin, N. W. Ohio Medical Association 1875
Willson, W. H., Greenfield, Highland Co. Medical Society 1865
Wilson, D. C., Ironton (Lawrence Co.) 1872
Wilson, J. L., Greenfield, Highland Co. Medical Society 1871
Wirt, W. E., Cleveland, Cuyahoga Co. Medical Society 1891
Wirth, R., Columbus, Central Ohio Medical Society 1886

Wise, D. B., Mt. Eaton (Wayne Co.).....1881
Wood, J. S., Collinwood (Cuyahoga Co.).....1880
Woodbridge, Jon E., Youngstown, Mahoning Co. Med. Soc.....1886
Woodruff, L., Alton (Franklin Co.).....1867
Woods, D. B., Warren, Trumbull Co. Medical Society.....1852
Woods, Jos. T., Toledo, Toledo Medical Association.....1862
Wright, John W., Columbus, Columbus Medical Club.....1885
Wright, S. St. John, Tallmadge, Summit Co. Medical Society...1880
Wright, T. B., Circleville.....1890
Wright, T. M., Troy, Miami Co. Med.-Chir. Society.....1891
Wylie, A. N., Ripley (Brown Co.).....1866
Wylie, J. L., Ripley (Brown Co.).....1872
Yost, W. N., Mt. Blanchard, Hancock Co. Medical Society.....1879
Ziegler, H. H., Ayersville, North-western Ohio Med. Ass'n.....1884
Zenner, Phillip, Cincinnati, Academy of Medicine..... 1882
Zoffi, W. J., Findlay, Hancock Co. Medical Society.....1891

ACADEMY OF MEDICINE OF CINCINNATI.*

AUXILIARY SINCE 1875. †AFFILIATED 1892–1893.

ANNUAL MEETING, FIRST MONDAY IN MARCH.

COMEGYS, C. G.....President.
ZINKE, E. GUSTAV.....First Vice-President.
STEVENS, E. S.....Second Vice President.
DEBECK, DAVID.....Recording Secretary.
JONES, GEO. E.....Treasurer.
OLIVER, J. C.....Corresponding Secretary.
FACKLER, G. A.....Librarian.
MURPHY, JOHN A.....
REAMY, THAD. A.....} Trustees.
DANDRIDGE, N. P.....

MEMBERS.

Abbott, C. N.....686 Freeman Avenue.
Adams, E. P.....Rockdale and Main Avenues, Avondale.
Agin, C. C.....231 Dayton Street.
Allen, John R.....Covington, Ky.
Allen, George M.....96 Auburn Avenue, Mt. Auburn.
Allen, S. E.....137 West Eighth Street.
Averdick, J. A.....Covington, Ky.
Ayres, S. C.....64 West Seventh Street.
Adams, J. M.....Station A.
Albers, H. W.....408 Race Street.
Armstrong, C. L.....John and Clark Streets.
Bailey, W. W.....206 Cook Street.
Bange, Theo.....313 Harrison Avenue.
Bartley, J. M.....Riverside, O.
Beebe, Brooks F.....70 East Fourth Street.

*Academy of Medicine of Cincinnati and Cincinnati Medical Society consolidated 1893.

†Affiliated is here used to designate those societies that formally joined the State Society in a body, in 1892-93.

Italics: Deceased since last report.

Bell, C. A.....157 West Ninth Street.
Bell, W. H.....290 Race Street.
Birchard, A. D.....Harrison and McLean Avenues.
Blair, H. M .....Covington, Ky.
Bogle, Jessie T.....Neave Building.
Bonifield, C. L.....280 West Fourth Street.
Bower, S. W.....86 West Seventh Street.
Boylan, J. E.....113 Broadway.
Brady, M. B.....Station C.
Bramble, D. D.....165 Broadway.
Brent, C. P.....133 West Eighth Street.
Brown, A. M.....436 West Eighth Street.
Brown, Hattie C.....255 West Eighth Street.
Brown, Joseph E.....112 Thirteenth Street.
Bruehl, Gustave.....367 John Street.
Buckner, J. H.....65 East Fourth Street.
Burhans, C. A.....84 Clark Street.
Buxbaum, A. I. F.....125 West Eighth Street.
Bauer, Arthur C.....324 Walnut Street.
Caldwell, Chas.....449 Kemper Lane, Walnut Hills.
Caldwell, J. S.....192 West Seventh Street.
Cameron, Otis L.....132 West Eighth Street.
Carothers, Robert.....Newport, Ky.
Carpenter, Julia W.....532 McMillan Street.
Carr, L. C.....448 West Seventh Street.
Carson, Arch. I.....115 Broadway.
Cassat, M.....313 Elm Street.
Cleveland, J. L.....Seventh and Baymiller Streets.
Conley, Cora C.....508 West Seventh Street.
Conner, George.....448 West Ninth Street.
Conner, P. S.....159 West Ninth Street.
Colter, LeR. S.....67 West Eighth Street.
Corboy, C.....213 Freeman Avenue.
Culbertson, J. C.....203 West Seventh Street.
Comegys, C. G.....79 West Eighth Street.
Cullen, G. I.....478 West Sixth Street.
Culver, J. C.....1023 West Eighth Street.
Dandridge, N. P.....148 Broadway.
Davis, Clark W.....310 Elm Street.
Davis, J. D.....Third and Broadway.
David DeBeck.....Ninth and Race Streets.
DeCourcey, W. E.....475 West Eighth Street.
Denman, L. M.....132 West Ninth Street.

DeWitt, W. H.....35 Auburn Avenue, Mt. Auburn.
Dickey, Eliza A.....100 Linn Steeet.
Dodd, C. W.....Neave Building.
Dodds, J. W.....Mt. Washington, O.
Dorschug, F. P.....Molitor Street and Highland Avenue.
Dowling, F.....164 West Ninth Street.
Drury, A. G.....57 Gest Street.
Dunham, W. H.....114 Dayton Street.
Egar, J. M.....U. S. Marine Hospital.
Ellis, A. N.....N. W. Corner Sixth and Walnut Streets.
Eichberg, Jos.....N. E. Corner Seventh and John Streets.
Eichberg, Julius.....50 West Ninth Street.
Ernst, A. B.....Covington, Ky.
Evans, A. E.....Palmer House, Chicago.
Evans, Chas. S.....89 West Eighth Street.
Everts, O.....College Hill, O.
Fackler, Geo. A.....136 West Eighth Street.
Falls, W. H.....314 West Seventh Street.
Fauth, Otto.....44 Fourteenth Street.
Fels, G. W.....126 Imogene Street (Station E).
Fennel, O. W.....445 Walnut Street.
Fibbe, J. H.....25 West Ninth Street.
Fischer, P.....130 Laurel Street.
Fitzpatrick, T. V.....136 West Eighth Street.
Fletcher, M. H.....67 West Seventh Street.
Foertmeyer, C. H.....486 West Eighth Street.
Fogel, L. J.....94 Clinton Street.
Forchheimer, F.....Ortiz Building.
Forchheimer, W.....Ortiz Building.
Freeman, L.....138 West Seventh Street.
French, Jas. M.....250 West Seventh Street.
French, H. W.....21 Apple Street (Station A).
Gavin, W. J.....242 Clark Street.
Glaeser, Bertha L.....280 West Eighth Street.
Goode, B. P.....444 Baymiller Street.
Goode, Geo. H.....Seventh and John Streets.
Goode, S. B.....56 Wheeler Street.
Greiwe, J. E.....442 Broadway.
Grimm, Adolf.....111 McMicken Avenue.
Gunkel, H. C.....Race Street.
Haile, G. W.....Third and Broadway.
Haines, W. D.....583 Freeman Avenue.
Hall, R. B.....154 West Eighth Street.

Harff, B. H.....Walnut Hills.
Hays, T. W.....674 Vine Street.
Hazzard, J. H.....47 Lawrence Street.
Heflebower, R. C.....132 West Eighth Street.
Heise, O. N.....82 West Eighth Street.
Hendley, F. W.....Cincinnati Hospital.
Herzog, Max.....50 West Ninth Street.
Hilkowitz, Wm.....269 West Seventh Street.
Hoeltge, A. E.....322 Linn Street.
Holmes, C. R.....84 West Seventh Street.
Holt, O. P.....134 West Ninth Street.
Hoppe, H. H.....445 Walnut Street.
Hottendorf, L. P.....92 Bank Street.
Hyndman, Jas. G.....98 West Ninth Street.
Harmon, Frank W.....Longview Asylum.
Hoffman, C. E.....Race Street.
Hofman, Geo. O.....679 Race Street.
Ingram, Robert.....124 Hopkins Street.
Jacobs, Ernst.....26 Findlay Street.
Johnston, J. A.....40 Everett Street.
Jones, Geo. E.....125 West Eighth Street.
Jones, Robert.....201 Park Avenue, Walnut Hills.
Joseph, Leopold.....126 West Seventh Street.
Judkins, C. P.....Sixth and Park Streets.
Judkins, Wm.....134 West Eighth Street.
Juler, H. C.....119 West Eighth Street.
Kammann, A. A.....98 Molitor Street.
Kebler, Frederic.....159 West Ninth Street.
Keck, P. A.....682 Race Street.
Kelley, Will H.....Covington, Ky.
Kieley, W. E.....146 Broadway.
King, J. R.....548 East Third Street.
Klein, A. W.....431 West Seventh Street.
Knight, W. L.....119 West Eighth Street.
Knight, A. L.....Madisonville, O.
Koehler, Max.....124 West Ninth Street.
Kramer, F. H.....376 Baymiller Street.
Kramer, S. P.....23 West Ninth Street.
Krouse, L. J.....302 West Eighth Street.
Kemper, A. C.....101 Broadway.
Kalloch, P. C.....United States Marine Hospital.
Kunz, J.....165 Broadway.
Krieger, G. L.....Madisonville, O.

Kearns, Chas.....135 West Seventh Street.
Landis, J. H.....80 West Eighth Street.
Langdon, F. W.....65 West Seventh Street.
Lemmon, J. F.....Main and Rockdale Avenues, Avondale.
Lewis, W. E.....85 East Fifth Street.
Longfellow, R. C.....21 Clark Street.
Luff, T. R.....677 Eastern Avenue.
Lyle, Ben. F.....1006 West Eighth Street.
Marcus, Jos. C.....259 West Eighth Street.
Marcus, Jule E.....259 West Eighth Street.
Marsh, F. O.....646 Main Street.
McAllister, Kate.....273 West Ninth Street.
McKee, Ed. S.....57 West Seventh Street.
McKenzie, J. C.....163 West Seventh Street.
McMechan, J. C.....367 West Seventh Street.
Miles, A. J.....65 West Eighth Street.
Mills, O. S.....171 Broadway.
Mitchell, Ed. W.....Main and Ridgeway Avenues, Avondale.
Mitchell, Giles S.....277 West Eighth Street.
Mussey, Wm. L.....63 West Eighth Street.
Murphy, John A.....163 West Seventh Street.
Murphy, J. W.....436 West Eighth Street.
Muscroft, Chas. S.....163 West Ninth Street.
Murnan, John R.....Covington, Ky.
Molloy, John J.....Covington, Ky.
MacMillan, Wade.....125 West Eighth Street.
Neff, Wallace.....138 West Seventh Street.
Newfarth, L.....Mt. Healthy, O.
Nickles, S.....410 John Street.
Niedermeyer, G. A. H.....1304 West Sixth Street.
Oelschlegel, F.....250 Clinton Street.
Oliver, J. C.....79 West Eighth Street.
Orr, Geo. B.....101 East Fourth Street.
Palmer, C. D.....308 West Seventh Street.
Parker, A. J.....Zanesville, O.
Phelps, A. V.....197 Central Avenue.
Porter, W. D.....565 McMillan Street.
Prendergast, J. W.....266 West Eighth Street.
Prior, Amelia J.....127 West Eighth Street.
Phythian, C. T.....57 East Fourth Street.
Querner, L. A.....412 Race Street.
Rachford, B. K.....Newport, Ky.
Ratterman, B.....524 Elm Street.

Ransohoff, Jos.....296 Walnut Street.
Ravogli, A.....88 West Seventh Street.
Reamy, Thad. A.....Oak Street and Reading Road.
Reed, Chas. A. L.....311 Elm Street.
Reemelin, R.....493 Elm Street.
Richards, W. D.....Dayton, Ky.
Richardson, A. B.....Insane Asylum, Columbus, O.
Ricketts, B. Merrill.....137 Broadway.
Ricketts, Edwin.....137 Broadway.
Ricketts, Jos.....138 Broadway.
Roads, W. M.....89 West Eighth Street.
Rosenfeld, A.....East Locust Street, Walnut Hills.
Rover, H. W.....Ohio Avenue and Lyons Street.
Rowe, G. S.....64 West Seventh Street.
Ryan, Geo. W.....114 West Ninth Street.
Sattler, Eric E.....117 West Eighth Street.
Sattler, Robert.....64 West Seventh Street.
Schenck, W. E.....65 West Seventh Street.
Schmidt, Theo.....20 West Ninth Street.
Schoolfield, C. B.....Dayton, Ky.
Schoolfield, Douglas.....Bellevue, Ky.
Schwab, Emmanuel.....Madisonville Road, East Walnut Hills.
Schwab, Louis.....Blue Rock Street, Twenty-fifth Ward.
Schwagmeyer, C. A.....665 Elm Street.
Seely, W. W.....“Alta,” Fourth and Sycamore Streets.
Shaller, J. M.....49 Webster Street.
Shaw, W. E.....489 Colerain Avenue.
Shumard, C.....(Station C.)
Singleton, J. B.....60 West Ninth Street.
Sittel, Theo.....174 East Pearl Street.
Southgate, F.....Newport, Ky.
Speidel, C. G. E.....401 Elm Street.
Spence, C. J.....Elmwood Place, O.
Stanton, Byron.....157 Dayton Street.
Stapleford, A. D.....North Fairmount.
Stark, Oscar W.....61 West Eighth Street.
Stevens, Ed. S.....Lebanon, O.
Stevenson, John W.....135 West Seventh Street.
Stewart, Robt. W.....45 West Eighth Street.
Straehley, E. O.....442 Linn Street.
Stricker, Louis.....58 West Eighth Street.
Sudhoff G. F.....478 Elm Street.
Taft, J.....Third and Broadway.

Taft, Wm.....122 Broadway.
Tangeman, C. W.....393 Elm Street.
Tate, M.....Third and Broadway.
Taylor, W. H.....329 West Seventh Street.
Thompson, J. A.....154 West Eighth Street.
Thorner, Max.....141 West Eighth Street.
Thrasher, A. B.....157 West Ninth Street.
Thuman, G. H.....588 Elm Street.
Tingley, W. S.....Newport, Ky.
Trush, J.....144 Broadway.
Tucker, A. A.....Betts Street and Central Avenue.
Twitchell, G. B.....556 Freeman Street.
Taggert, T. E.....Fairmount.
Vail, D. T.....84 West Seventh Street.
Van Zant, C. B.....66 Franklin Street.
Walker, A. R.....1079 Vine Street.
Walker, Ed. W.....96 West Eighth Street.
Weaver, W. B.....80 West Eighth Street.
Wenning, W. H.....126 Laurel Street.
Werner, G. C.....61 West Twefth Street.
White, T. P.....34 Clark Street.
Whittaker, J. T.....100 West Eighth Street.
Williams, M. M.....141 West Eighth Street.
Winnes, Thos. D.....596 Freeman Avenue.
Withrow, John M.....300 West Seventh Street.
Wolfstein, David I.....137 West Eighth Street.
Woodward, A. J.....149 West Eighth Street.
Woodward, W. R.....116 West Ninth Street.
Wittkamp, T. W.....Walnut and Mary Streets.
White, R. A.....25 Paradrome Street.
Young, Dan S.....248 West Seventh Street.
Zenner, Philip.....335 West Ninth Street.
Zinke, Gustav.....85 West Eighth Street.

ADAMS COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1888. AFFILIATED 1892–93.

ANNUAL MEETING IN JUNE.

COLEMAN, W. K.....President.
STEVENSON, R. A.....Vice-President.
BUNN, JAS. W. .....Secretary.
KIRKPATRICK, O. B.....Treasurer.

MEMBERS.

Berry, J. S.....Peebles.
Bunn, Jas. W.....West Union.
Coleman, W. K.....West Union.
Corboy, C. S..... Winchester.
Foster, E. M.....Manchester.
Gaston, E. M. (Censor) .....Tranquility.
Grimes, L. B.....Stouts.
Guthrie, J. W. (Censor) .....Manchester.
Kirkpatrick, O. B.....Cherry Fork.
Hughes, ——, (Censor).....
Lockhart, J. M.....Eckmansville.
Sproull, O. T.....Bentonville.
Stevenson, R. A.....Manchester.
Wittenmyer, J. M..... .....Peebles.

ALLEN COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1887. AFFILIATED 1892–1893.
ANNUAL MEETING IN MAY.

WEADOCK, T. M. ..... President.
HOOVER, W. E. ..... Vice-President.
BENNETT, H. C. ..... Secretary.
STEUBER, L. J. ..... Treasurer.

MEMBERS.

Baldwin, F. J. ..... Bluffton.
Barr, Eugene J. ..... Hume.
Bates, F. L. ..... Lima.
Bennett, H. C. ..... Lima.
Brooks, P. H. ..... Lima.
Burton, E. G. ..... West Minister.
Clark, J. R. ..... Bluffton.
Clippinger, J. L. ..... West Cairo.
Ewing, Frank ..... West Cairo.
Goeble; Miss Anna M. ..... Lima.
Harper, W. H. ..... Lima.
Herrmann, S. S. ..... Lima.
Hiner, S. B. ..... Lima.
Hitchcock, Salathiel A. ..... Elida.
Hoover, W. E. ..... Lima.
Hornell, J. Guy. ..... Beaver Dam.
Kahle, R. D. ..... Lima.
Kahle, A. W. ..... Lima.
Kemper, H. C. ..... Wapakonetta.
Krebs, R. L. ..... West Minister.
Matterson, D. E. ..... Lima.
Marsh, J. McC. ..... Delphos.
Mumaugh, Shelby. ..... Lima.
Pence, J. C. ..... Spencerville.
Potts, C. N. ..... Lima.
Roush, Wm. ..... Elida.
Rudy, A. S. ..... Lima.

Stemen, H. G.....Delphos.
Steiner, D. W.....Lima.
Stueber, F. G.....Lima.
Stueber, L. J.....Lima.
Sullivan, Wm.....West Minister.
Terwillager, T. R.....Lima.
Thomas, Charles.....West Cairo.
Thrift, R. W.....Lima.
Vail, J. B.....Lima.
Ward, C. L.....Cridersville.
Weadock, T. M.....Lima.

ASHTABULA COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1878. AFFILIATED 1892–93.

ANNUAL MEETING IN AUGUST.

BURROWS, S. S.....President.
GILCHRIST, W. L.....Vice-President.
ELLSWORTH, W. O.....Secretary.
HOPKINS, A. W.....Treasurer.

MEMBERS.

Aldrich, D. B.....Harbor.
Anderson, G. S.....Andover.
Burrows, S. S.....Geneva.
Case, F. D .....Ashtabula.
Dickson, J. A.....Ashtabula.
Dorman, H. W.....Harbor.
Ellsworth, W. O.....Austinburg.
Flower, Wallace R.....Ashtabula.
Fox, C. L.....Kingsville.
Gilchrist, W. L.....Ashtabula.
Graham, J. W.....West Williamsfield.
Grover, C. F.....Orwell.
Hopkins, A. W.....Ashtabula.
Merriam, E. D.....Conneaut.
Palmer, D. G.....Geneva.
Pomeroy, D. G.....Windsor.
Rathbone, A. G.....South New Lyme.
Sargant, F. S.....Cherry Valley.
Shatto, H. J.....Colebrook.
Tibbets, F. E.....Conneaut.
Tower, B. W.....Conneaut.
Upson, F. W.....Conneaut.
Ward, W. A.....Conneaut.
Webster, E. M.....Kingsville.
Webster, George E.....Kingsville.

BELMONT COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1887. AFFILIATED 1892–93.

ANNUAL MEETING IN DECEMBER.

McCLELLAN, J. S.....President.
KÖRNER, A. H.....Vice-President.
COLVILLE, J. H.....Treasurer.
COOPER, J. W.....Secretary.

MEMBERS.

Alexander, E. C.....St. Clairsville.
Blackford, J. M.....Martins Ferry.
Boone, D. W.....Bellaire.
Boone, J. S. (Censor).....Powhattan.
Clarke, J. A.....Glencoe.
Colville, G. H.....Harrisville.
Cook, John.....Bridgeport.
Cooper, J. W.....Bellaire.
Cope, I. G.....Cope.
Douglass, R. A.....Barnhill.
Ely, J. S.....Barnesville.
Estep, Wm.....Loydsville.
Fisher, W. E.....Bridgeport.
Frame, C. A.....Cambridge, Guernsey Co.
Gregg, S. T.....Belmont.
Hawthorn, Ellis W.....Coleraine.
Heinlein, A. J.....Bridgeport.
Hervey, W. E.....Martins Ferry.
Hewettson, A. H. (Censor).....St. Clairsville.
Hobensack, J. D.....Martins Ferry.
Hobson, J. A. (Censor).....Flushing.
Hogan, J. M.....Warnock.
Huston, W. O.....Bellaire.
Kerns, J. F. W.....Bellaire.
Korrell, A. H.....Armstrongs Mill.
Körner, A. H.....Armstrongs Mill.

Kurtz, C. E..... Chicago.
Long, D. W. (Censor).....Bellaire.
McClellan, J. S.....Bellaire.
McGlenn, J. A.....Mt. Pleasant.
Piper, Wm.....Bellaire.
Piersol, Jos.....Bellaire.
Riggs, E. W.....Powhattan.
Shuttleworth, W. B.....Martins Ferry.
Smith, H. M.....Clarington, Monroe Co.
Snowd, G. T.....Glencoe.
Spence, J. A.....960 Liberty Avenue, Pittsburg.
Thompson, W. E .....Loydsville.
Walker, D. S.....St. Clairsville.
Webster, J. V..... .....Flushing.
Wellons, J. W.....Barnesville.
Wellons, G. L.....Barnesville.
West, S. L.....St. Clairsville.
West, J. P.....Bellaire.
Williams, B. O. (Censor).....Martins Ferry.
Workman, J. C.....Uniontown.

BROWN COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1892. AFFILIATED 1892–93.

ANNUAL MEETING IN MAY.

GORDON, THOS. W.....President.
DICKSON, W. A.....Vice-President.
ELLSBURY, A. M.....Treasurer.
MARKLEY, L.....Secretary.

MEMBERS.

Beck, I. N., (Hon.).....Sardinia.
Bivans, W. A.....New Hope.
Dixon, W. A.....Ripley.
Ellsbury, A. M.....Georgetown.
Ellsbury, W. W.....Georgetown.
Francis, A. W.....Ripley.
Gilfillen, A.....Russellville.
Gordon, Thos. W.....Georgetown.
Heaton, T.....Aberdeen.
Hantz, Jas. W.....Arnheim.
Love, E. W.....Fayetteville.
Markley, L.....Georgetown.
McCall, R. B.....Hamersville.
McLane, J. B.....Sardinia.
Salisbury, J. N.....Russellville.
Sheldon, S. B.....Five Mile.
Stephson, N.....Georgetown.

BUTLER COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1852. AFFILIATED 1892-93.

ANNUAL MEETING IN JANUARY.

BARTHOLOMEW, J. N.....President.
CARTER, H. H.....Vice-President.
MILLIKIN, MARK.....Treasurer.
BARDEN, F. M.....Secretary.

MEMBERS.

Abott, E. H.....Somerville.
Barden, F. M.....Hamilton.
Bartholomew, J. N.....Trenton.
Beeler, S. L.....Hamilton.
Behrens, T. J.....Middletown.
Bundy, D. B.....Middletown.
Carsons, O. M.....Middletown.
Carter H. H.....Hamilton.
Cook, Geo. F.....Oxford.
Dickey, T. A.....Middletown.
Falconer, Cyrus.....Hamilton.
Fitzpatrick, T. V.....Cincinnati.
Fitton, E. M.....Hamilton.
Francis, John.....Millville.
Grafft, John.....Hamilton.
Hancock, W. D.....Millville.
Hill, Edward L.....Oxford.
Hinkley, H. D.....Oxford.
Hoover, Chas. C......Ross.
Huston, C. N.....Hamilton.
Jacobs, M. M.....Hamilton.
Long, Jas.....Millville.
Lummis, George D.....Middletown.
McReady, Jas.....Monroe.
Mayor, O. W.....Hamilton.
Millikin, Dan.....Hamilton.

Millikin, Mark.....Hamilton.
Owesley, J. B.....Jacksonburg.
Reed, C. A. L.....Cincinnati.
Roll, J. H.....Hamilton.
Scheel, J. A.....Hamilton.
Scobey, Wm. H.....Hamilton.
Sill, E. C.....Hamilton.
Skinner, George C.....Hamilton.
Smith, H. L.....Middletown.
Thonin, G. F.....Shandon.
Trembly, J. M .....Reily.
Twitchell, H. E.....Hamilton.
Wasson, C. C.....Hamilton.

CENTRAL OHIO MEDICAL SOCIETY.

AUXILIARY SINCE 1869. AFFILIATED 1892–93.

ANNUAL MEETING IN JULY.

WIRTH, R.....President.
LAWRENCE, F. F.....Vice-President.
NASH, W. H. H.....Treasurer.
CLOUSE, GEO. M.....Secretary.

MEMBERS.	COLUMBUS.
Allen, H. P.	73 East State Street.
Baldwin, J. F.	112 North Fourth Street.
Barnhill, J. V.	188 East Town Street.
Berry, J. E.	656 West Broadway.
Blake, F. W.	33 South Fourth Street.
Blesch, P. S.	198 South Third Street.
Bowen, A. H.	56 South Fourth Street.
Brown, J. E.	235 East Town Street.
Clarke, C. F.	188 East State Street.
Clouse, Geo. M.	1099 Mt. Vernon Avenue.
Cooper, A.	2686 North High Street.
Dumm, L. C.	1499 North High Street.
Emerick, E. J.	1126 Neil Avenue.
Evans, A. E.	145 East Long Street.
Frankenburg, O. F.	310 East Rich Street.
Fraper, H. C.	1128 East Main Street.
Gay, N.	26 West Gay Street.
Gilliam, E. M.	50 North Fourth Street.
Graham, J. C.	73 East State Street.
Guerin, Z. F.	802 West High Street.
Gunsaulus, F.	29 West Long Street.
Hamilton, C. L.	142 East Long Street.
Hamilton, J. W.	122 East Long Street.
Hamilton, W. D.	142 East Long Street.
Havens, W. V.	162 Hamilton Avenue.
Hendrixon, H.	11 West Goodale Street.
Hendrixon, Mrs. H	11 West Goodale Street.
Hoover, T. C.	249 East State Street.
Howell, C. A.	873 North High Street.
Jones, T. W.	Corner Broad and Nelson Streets.
Kinsman, D. N.	The Normandie.
Landon, C. P. (Censor)	1219 East Long Street.
Lawrence, F. F.	570 East Long Street.
Lawrence, J. C.	552 North High Street.
Leeper, John A.	Corner Town and Third Streets.

COLUMBUS.

Liuebough, J. A.....742 High Street.
Loving, S.....229 East State Street.
Maris, C. M.....77 East State Street.
Means, W. J.....669 North High Street.
Montgomery, C. R. (Censor)..Cor. High and Sixth Sts.
Murray, G. W.....563 South Third Street.
Nash, W. H. H.....137 North Grant Avenue.
Overly, J. E.....1452 East Main Street.
Probst, C. O.....State House.
Ritter, A. L.....East Side Cleveland Avenue.
Rowles, W. T.....69 North Fourth Street.
Schneller, J. B.....443 South High Street.
Sharp, A.....
Stein, G. L.....344 South High Street.
Stritinather, Lucy B.....115 North Grant Avenue.
Taylor, L. B.....Third and Beck Streets.
Turney, C. F.....1000 Mt. Vernon Avenue.
Warner, F.....Park Hotel Building.
Wilson, E. J.....62 East Broad Street.
Wirth, R.....716 South High Street.
Wright, J. W.....133 East Spring Street.
Blake, W. H.....Shadesville.
Beech, I. N.....West Jefferson.
Dennison, A. N. (removed).....
Fallett, A.....Grandville.
Hoover, L. S.....Grove City.
Hyatt, E. H.....Delaware.
Jewett, S. O.....Hilliard.
Jenkins, M. J.....Plain City.
Johnston, O.....Worthington.
Jones, T. W.....London.
McIntire, Wm.....Warrensburg.
Mills, J. T.....Jersey.
Oliver, A. H. (resigned).....
Pinkerton, W. S.....Galloway.
Ramsey, S. W.....Hope.
Reed, R. Harvey.....Mansfield.
Richard, S. S.....Outville.
Reynolds, W. W. (removed).....
Rutlege, Ella B. (removed).....
Sharp, H. J.....London.
Thomas, F. W.....Marion.
Vanderburg, C. R......
Woodruff, L. (Censor).....Alton.

CHAMPAIGN COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1879. AFFILIATED 1892–93.

ANNUAL MEETING IN APRIL.

MOSGROVE, S. M.....President.
HUNT, H. B.....Vice-President.
PEARCE, H. M.....Secretary.
LONGFELLOW, J. V.....Librarian.

MEMBERS.

Ayers, J. H. (Censor).....Urbana.
Baker, B. F.....St. Paris.
Clarke, J. H.....Mechanicsburg.
Demand, C. E.....Mechanicsburg.
Emmonds, D. R.....North Lewisburg.
Goddard, J. W.....Urbana.
Henderson, Robt.....Urbana.
Hodges, George H.....Urbana.
Hunt, H. B.....Careyville.
Imhoff, C. E.....Urbana.
Longfellow, J. V.....Urbana.
Moore, S. C.....Cable.
Mosgrove, J. M.....Urbana.
Mosgrove, S. M.....Urbana.
Mosgrove, W. A.....Urbana.
Musson, J. J.....St. Paris.
Nincehelser, O. A.....Mechanicsburg.
Pearce, A. B.....King's Creek.
Pearce, H. C.....Urbana.
Pearce, H. M.....Urbana.
Pickering, G. W.....Eris.
Preston, H. S.....Mutual.
Sullivan W. J.....Urbana.
Williams, A. T.....North Lewisburg.
Wolfe, J. H.....King's Creek.

CLERMONT COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1854. AFFILIATED 1892–93.
ANNUAL MEETING IN OCTOBER.

MITCHELL, T. A.....President.
REDRON, ISAAC.....Vice-President.
ASHBURN, ALLEN W.....Secretary.
KENNEDY, P.....Treasurer.

MEMBERS.

Abbott, Julius D.....Bethel.
Anderson, F. W.....Newtonville.
Anderson, W. S.....Newtonville.
Andrews, J. H.....Goshen.
Ashburn, Allen W.....Batavia.
Ashburn, Percy M.....Batavia.
Belt, R. C.....Milford.
Bennett, C. A.....Withamsville.
Bishop, L. W.....Batavia.
Bishop, L. W., Jr.,.....Loveland.
Bivens, W. A.....New Hope.
Brown, H. M.....Hillsboro.
Bradley, N. E.....Felicity.
Bryan, A. S.....Los Angeles, Cal.
Canter, S. A.....Pt. Isabel.
Carmichael, W. A.....Loveland.
Collins, A. R.....Darbyville.
Coombs, J. S.....Owensville.
Curry F. C.....Milford.
Darby, Frank K.....Morrowtown.
Davy, R. B.....California.
Dickey, J. A.....Mt. Washington.
Dickinson, T. E.....Cincinnati.
Donham, H. L.....Goshen.
Ellsbury, Solon.....Bethel.

Ellsbury, W. S.....Bethel.
Erdman, R. F.....New Richmond.
Fee, E. B.....Georgetown.
Fitzpatrick, T. V.....Cincinnati.
Formorin, J. L.....Marathon.
Gordon, Thomas W.....Georgetown.
Hill, F. E.....Neville.
Hill, N. S.....Neville.
Hines, George L.....Williamsburg.
Hulick, J. W.....Springfield.
Ireton, E. C.....Marathon.
Kennedy, Charles.....Laurel.
Kennedy, P.....Laurel.
Love, J. H.....Hamersville.
Love, Wesley.....Higginsport.
McKee, A. B.....Felicity.
McKibben, C. T.....Moscow.
McKibben, Jas.....Moscow.
McKibben, Wm.....Moscow.
Marsh, J. O......Madisonville.
Medoris, L. H.....Owensville.
Mendenhall, J. W.....Marathon.
Mitchell, T. A.....Owensville.
Moore, A. C.....Amelia.
Morris, A.....Goshen.
Mullen, T. J.....New Richmond.
Redron, Isaac.....Williamsburg.
Richardson, J. P.....Bantam.
Scott, Thomas L.....Loveland.
Scoville, S. S.....Lebanon.
Shrofe, W. J.....Hamersville.
Spence, C. J.....Ivorydale.
Terwillager, T. R.....Lima.
Thomson, W. E.....Bethel.
Walton, C. C.....Marathon.
Wheeler, J. A.....Mt. Carmel.
Witham, Samuel.....Newtown.

CRAWFORD COUNTY MEDICAL SOCIETY.

AFFILIATED 1893.

ANNUAL MEETING IN MARCH.

CAMPBELL, JOHN.....President.
DUNCAN, A. M.....Secretary and Treasurer.

MEMBERS.

Bland, J.....Bucyrus.
Bevington, H. S.....Sulphur Springs.
Campbell, John.....Galion.
Chesney, J. A.....Bucyrus.
Duncan, A. M .....Bucyrus.
Fitzsimmons, J. F.....Bucyrus.
Kelly, Webb J.....Galion.
Kemp, Lucia.....Bucyrus.
McCrory, A. H.....Bucyrus.
Noblet, C. H.....Bucyrus.
Rininger, E. M.....Chatfield.
Sexaur, C. F.....Chatfield.
Trimble, C. E.....Crestline.
Vannette, Westley.....Poplar.
Virtue, F. M.....Sulphur Springs.

CUYAHOGA COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1879. AFFILIATED 1892–93.
ANNUAL MEETING IN MAY.

BAKER, A. R. ..... President.
KNOWLTON, W. A. ..... First Vice-President.
BOGGS, JESSIE ..... Second Vice-President.
WOLFENSTEIN, J. ..... Secretary.
CHADWICK, L. S. ..... Treasurer.

MEMBERS.

Albl, M. A. ..... 1406 Broadway.
Aldrich, C. J. (Censor) ..... 637 Central Avenue.
Allen, D. P. ..... 278 Prospect Street.
Arms, C. C. ..... 104 Euclid Avenue.
Ashmum, G. C. ..... 798 Republic Street.
Baker, A. R. ..... 122 Euclid Avenue.
Baker, C. ..... 553 Kinsman Street.
Boggs, Miss J. ..... 1210 Euclid Avenue.
Brandenburg, F. D. ..... 450 Prospect Street.
Brashear, B. B. ..... 375 Prospect Street.
Bunts, F. E. ..... 380 Pearl Street.
Burdick, H. J. ..... 519 Cedar Avenue.
Burton, E. D. ..... Collamer, Ohio.
Burton, F. D. ..... Collamer, Ohio.
Campbell, O. B. ..... 993 Cedar Avenue.
Carlisle, I. W. ..... Glenville, Ohio.
Carpenter, E. G. ..... 1226 Euclid Avenue.
Case, G. B. ..... 106 Euclid Avenue.
Chadwick, L. S. ..... 1930 Euclid Avenue.
Clapp, H. T. ..... 50 Euclid Avenue.
Clark, F. S. ..... 331 Prospect Street.
Clewell, H. M. ..... 785 Woodland Avenue.
Cook, A. J. ..... 2220 Wilson Avenue.
Corlett, W. T. (Censor) ..... 333 Prospect Street.
Cotton, C. E. ..... 50 Euclid Avenue,
Craft, J. ..... 64 Streator Avenue.

Crile, G. W.....380 Pearl Street.
Cushing, E. F.....967 Prospect Street.
Cushing, H. K.....967 Prospect Street.
Dutton, C. F.....122 Euclid Avenue.
Erwin, J. J.....1617 Cedar Avenue.
Foshay, P. M.....282 Prospect Street.
Fraser, J. M.....150 Woodland Avenue.
Gentsch, C.....167 Frankland Avenue.
Goetz, E. P.....330 Woodland Avenue.
Goetz, F. E.....330 Woodland Avenue.
Gordon, O. F.....712 Prospect Street.
Henderson, H. E.....444 Dunham Avenue.
Handler, S.....2730 Broadway.
Hanson, D. S .....1419 Broadway.
Hart, A. G.....102 Jennings Avenue.
Hawley, E. P.....1666 Broadway.
Herrick, H. J.....355 Erie Street.
Himes, I. N.....603 Prospect Street.
Hintzelman, C.....86 Randall Street.
Hobson, J. F.....Lakewood, O.
Hobson, J. F.....429 Prospect Street.
Holliday, B. W.....520 Prospect Street.
Holliday, W. W.....2588 Broadway.
Humiston, W. H.....356 The Arcade.
Jessom, J. F.....1167 Prospect Street.
Jenks, W. O.....Nottingham, Ohio.
Johnson, A. M.....99 Huron Street.
Jones, J. D.....1631 Havard Street.
Kaestlen, S. E.....615 Lorain Street.
Kelley, S. W.....837 Superior Street.
Kinnaman, C. L.....1474 Cedar Avenue.
Klein, C. H. Von.....122 Euclid Avenue.
Knowlton, W. A.....530 Jennings Avenue.
Kolb, M. G.....1007 Pearl Street.
Krause, B.....132 Woodland Avenue.
Lathrop, J. M.....Dover, O.
Lee, H. J.....341 Prospect Street.
Leick, G. F.....503 Prospect Street.
Lowman, J. H.....441 Prospect Street.
Lucas, V. C.....1101 Pearl Street.
Maynard, O. T.....Elyria, O.
McGee, J. B.....1405 Woodland Avenue.
McQuiston, H.....2608 Broadway.

Millikin, B. L.....278 Prospect Street.
Morton, F. J.....959 Lorain Street.
Norton, F. B.....19 Miles Avenue.
Oster, L. W.....1234 St. Clair Street.
Parker, C. B. ..... 564 Euclid Avenue.
Payne, F. A.....619½ Willson Avenue.
Perkins, D. S..... .....1225 Euclid Avenue.
Perrier, J..... .....425 Prospect Street.
Peskind, A..... 241 Scoville Avenue.
Powell, H. H .....467 Prospect Street.
Quirk, H. W..... .....1210 Euclid Avenue.
Rogers, H. W..... .....10 Vestry Street.
Rosenwasser, M.....732 Woodland Avenue.
Russell, G. C.....122 Euclid Avenue.
Sawyer, P. H.... ....54 Streeter Avenue.
Sawyer, J. P. (Censor).... .....122 Euclid Avenue.
Scott, N. S.....531 Prospect Street.
Scott, W. J.....531 Prospect Street.
Sherman, H. G.....29 Euclid Avenue.
Sihler, C.....832 Scanton Avenue.
Sipher, J. N.....76 Euclid Avenue.
Skeel, R. E..... .....1207 Pearl Street.
Smith, D. B.....16 Case Building.
Snow, L. B.....76 Euclid Avenue.
Somerville, G. H.....2487 Broadway.
Stevenson, G. W.....1439 Woodland Avenue.
Straight, H. S.....Hickox Building.
Strong, J.....39 Euclid Avenue.
Sykora, J.....1449 Broadway.
Thomas, O. T.....282 Prospect Street.
Tuckerman, L. B..... .....298 Central Avenue.
Upson, H. S.....341 Prospect Street.
Vance, R. A.....298 Prospect Street.
Voght, D. F.....59 Scoville Avenue.
Watson, G. N.....1829 Pearl Street.
Weber, G. C. E.....161 Prospect Street.
Weber, W. C.....405 Prospect Street.
Weidenthal, N.....300 Forest Street.
White, W. H.....119 Bolivar Street.
Wirt, W. E.....50 Euclid Avenue.
Wisner, A. P.....485 Pearl Street.
Wolfenstein, J.....106 Euclid Avenue.
Wood, A.....1270 Clark Avenue.

LIST OF MEMBERS OF THE

ERIE COUNTY MEDICAL SOCIETY

[illegible]

[illegible]

[illegible]

MEMBERS

[illegible] ... [illegible]
[illegible] ... [illegible]
[illegible] ... [illegible]
[illegible] ... [illegible]
[illegible] ... Port Clinton
[illegible] ... [illegible]
[illegible] ... [illegible]
[illegible] ... [illegible]
[illegible] ... Kelleys Island
[illegible] ... [illegible]
[illegible] ... Sandusky
[illegible] ... Sandusky
[illegible] ... Sandusky
[illegible] ... Norwalk
[illegible] ... Sandusky
[illegible] ... Vermilion
[illegible] ... Sandusky
[illegible] ... Monroeville
[illegible] ... Bloomingville
[illegible] ... Sandusky
[illegible] ... Sandusky
[illegible] ... Sandusky
[illegible] ... Put-in-Bay
[illegible] ... Castroville, Texas
[illegible] ... Castalia
[illegible] ... Lakeside (Ottawa)
[illegible] ... Chicago

FAYETTE COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1891. AFFILIATED 1892–93.

ANNUAL MEETING IN DECEMBER.

KELLAR, B. T.....President.
BLAKELEY, G. W.....Vice-President.
CLARKE, J. N.....Treasurer.
BOGGS, E. M.....Secretary.

MEMBERS.

Blakely, G. W. (Delegate).....Good Hope.
Black, F. M.....Washington C. H.
Boggs, E. M.....Marsh C. H.
Clark, J. N.....Madison Mills.
Foster, C. A. (Delegate).....Washington C. H.
Gillespie, J. M.....Bloomingburg.
Hare, D. H. (withdrawn).....Washington C. H.
Holdren, G. W.....Bloomingburg.
Howell, L. P.....Washington C. H.
Hughey, J. M. (Delegate).....Good Hope.
Howell, J. M.....Washington C. H.
Ireland, L. A.....Washington C. H.
Ireland, W. E.....Washington C. H.
Kellar, B. F.....Bloomingburg.
McFadden, L. M.....Staunton.
May, J. B.....New Holland.
Mason, J. F.....Milledgeville.
Marchant, Grant.....Milledgeville.
Roberts, S. C.....Washington C. H.
Scullock, W. S.....New Holland.
Teeters, C. A.....Jeffersonville.
Shearer, O. F. (removed).....Bloomingburg.
Williams, W. U. T. (removed).....Jeffersonville.

GREENE COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1888. AFFILIATED 1892–93.

ANNUAL MEETING IN JUNE.

ANDERSON, GEORGE.....President.
BRUNDAGE, L. H.....Treasurer.
GALLOWAY, C. M.....Secretary.

MEMBERS.

Anderson, George.....Alpha.
Baldwin, I. W.....Yellow Springs.
Brundage, A. H.....Xenia.
Brundage, L. H.....Xenia.
Cunningham, S. A.....Cedarville.
Donaldson, J. F.....Port William.
Edwards, J. D.....Xenia.
Findley, W. H.....Xenia.
Galloway, Wm. A.....Xenia.
Galloway, C. M.....Xenia.
Harris, J. M.....Yellow Springs.
Humphry, W. H.....Yellow Springs.
Jones, L. M.....Jamestown.
Kent, F. M.....Spring Valley.
Lindsey, F. T.....Xenia.
McClellan, B. R.....Xenia.
McClellan, H. R.....Xenia.
Marquart, O.....Osb[illegible]rn.
Moore, D. D.....Xenia.
Ryan, F. W.....Jamestown.
Rouse, W. L.....Paintersville.
Sewell, S. G.....New Burlington.
Spahr, C. H.....Jamestown.
Spahr, David.....Clifton.
Stewart, J. O.....Cedarville.
Stewart, J. M.....Cedarville.
Wilson, S. S.....Xenia.

HANCOCK COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1891. AFFILIATED 1892-93.

YOST, W. N.....President.
CLYMER, W. E.....Vice-President.
EWING, M. J.....Treasurer.
BAKER, J. P.....Secretary.

MEMBERS.

Baker, J. P.....Findlay.
Brayton, W. G.....Fostoria.
Elwell, W. M.....Van Buren.
Entriken, F. W.....Findlay.
Ewing, M. J.....Findlay.
Carrothers, M. M.....Findlay.
Clymer, W. E.....Mt. Cary.
Firmin, F. W.....Findlay.
Guise, J. M.....Findlay.
Guise, P. O.....Findlay.
Hersh, E. G.....McComb.
Howell, J. A.....Findlay.
Hurd, A.....Findlay,
Kimmell, J. A.....Findlay.
Lown, M. M.....Findlay,
McLachlan, N. L.....Findlay.
McLeod, J. R.....Findlay.
McLeod, C. D.....Findlay.
Martin, J. G.....Findlay.
Meagley, F. L.....Findlay.
Powell, J. E.....Findlay.
Saunders, O. H.....West Independence.
Switzer, C. C.....McComb.
Tritch, J. C.....Findlay.
Wilson, T. S.....Findlay.
Wilson, W. P.....Findlay.
Williamson, M. S.....Findlay.
Woods, T. E.....Rawson.
Woods, L. S.....Rawson.
Yost, W. N.....Findlay.
Zopfi, W. J.....Findlay.

HEMPSTEAD MEMORIAL ACADEMY OF MEDICINE.

AUXILIARY SINCE 1885. AFFILIATED 1892-93.

ANNUAL MEETING IN MAY.

FULTON, C. C.....President.
RASCHIG, WM.....Vice-President.
RARDIN, J. S.....Treasurer.
PIXLEY, M. S.....Secretary.

MEMBERS.

Allard, L. D.....Flat P. O., Pike Co.
Andre, O. C.....Piketon, Pike Co.
Beard, H. C.....Lucasville.
Champion, J. A.....New Mexico.
Cotton, D. B.....Portsmouth.
Crawford, J. N. W.....Portsmouth.
Frizelle, J. S.....Buena Vista.
Fulton, C. C.....Portsmouth.
Halderman, S. S.....Portsmouth.
Kline, P. J.....Portsmouth.
McKerrihan, S. B.....Portsmouth.
Marshall, Geo. M.....Portsmouth.
Pixley, M. S.....Portsmouth.
Ray, Jas. S.....Harrisonville.
Ralston, C. O.....California.
Rardin, J. S.....Portsmouth.
Stillman, F. L.....Columbus.
Taylor, J. L.....Wheelersburg.
Taylor, M.....Sciotoville.
Titus, A.....Portsmouth.
Vermis, Lewis.....French P. O.
Warwick, J. B.....Lucasville.
Warwick, C. M.....Lucasville.
Raschig, Wm......Portsmouth.

HIGHLAND COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1877. AFFILIATED 1892-93.

ANNUAL MEETING IN APRIL.

BEAM, A. H.....President.
SAMS, S. G.....Vice-President.
GLENN, W. W.....Corresponding Secretary.
NELSON, LOCKHART.....Recording Secretary.
SPEES, S. J.....Treasurer.

MEMBERS.

Beam, A. H.....Sugar Wesrige.
Beeson, H. A.....Leesburg.
Brown, H. M.....Hillsboro.
Chancy, S. F.....Pricetown.
Cornetett, Ed. W.....Hillsboro.
Duvall, T. W. (Censor).....Lynchburg.
Dwyer, R. A.....New Petersburg.
Glenn, W. W. (Censor).....Hillsboro.
Granger, F. M.....Russels.
Holmes, B. F.....Hillsboro.
Hook, O. C.....London.
Lafferty, N. B.....Hillsboro.
Leatherman, J. W.....New Market.
McBride, D. N.....Rainsboro.
McNulty, S. J.....North Union.
McNulty, J. H.....Marshall.
Mattheus, Jno. W.....Buford.
Nelson, Lockhart.....Hillsboro.
Patterson, W. S.....Hillsboro.
Roberds, T. W.....Sardinia.
Russ, H. A.....Hillsboro.
Sams, S. G.....Hillsboro.
Schrofe, W. J.....Lynchburg.
Schrofe, W. E.....Lynchburg.
Shepherd, W. W. (Censor).....Hillsboro.
Scott, W. T.....Marshall.
Spees, S. J.....Hillsboro.
Smith, C. B.....Hillsboro.
Van Winkle, N. B.....Blanchester.
Wilson, W. H.....Greenfield.
Wilson, J. L.....Greenfield.

WARREN COUNTY MEDICAL SOCIETY.*

AUXILIARY SINCE 1879. AFFILIATED 1892–93.

ANNUAL MEETING IN OCTOBER.

McCready, James.....President.
Hough, C. A.....Treasurer.
Blair, B. H.....Secretary.

MEMBERS.

Bishop, L.....Loveland.
Bishop, N. W.....Loveland.
Blair, B. H.....Lebanon.
Couden, J. T.....Morrow.
Collins, J. B.....Butterville.
Curry, G. M.....Lebanon.
Darby, F. H.....Morrow.
Death, H. J.....Franklin.
Evans, R. S.....Franklin.
Evans, O.....Franklin.
Evans, F. R.....Franklin.
Fisher, Herschel.....Lebanon.
Flemming, Jas. C.....Carlisle.
Frost, F. H.....Lebanon.
Greenly, Wm.....Lebanon.
Hall, C. T.....Mason.
Hough, C. A.....Lebanon.
Hough, J. B.....Waynesville.
Keever, B. W. D.....Centerville.
Kreiger, G. L.....Madisonville.
McCready, James.....Monroe.
Michel, Ralph.....Springboro.
Moss, W. F.....Maineville.
Mounts, Leonard.....Morrow.
Mounts, J. L.....Morrow.

*Formerly Lebanon Medical Society.

Murphy, A. D.....Cincinnati.
Oglesby, Wm. E.....Waynesville.
Roberts, A. C.....Harveysburg.
Sellers, Adam.....Lebanon.
Scoville, S. S.....Lebanon.
Sewel, S. G.....New Burlington.
Scott, Wm.....Loveland.
Scott, John.....Cincinnati.
Stevens, S.....Kings Mills.
Stevens, E. B.....Lebanon.
Stevens, E. S.....Lebanon.
Tickenor, E. J.....Lebanon.
Vanderwort, J. W.....Harveysburg.
Ward, J. W.....Lytle.
Williams, D. A.....Franklin.
Witham, J. E.....Harveysburg.
Wright, J. W.....Red Lion.
Wright, A. Y.....Blueball.

MAHONING COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1879. AFFILIATED 1892–93.
ANNUAL MEETING IN OCTOBER.

GIBSON, ROBERT D.....President.
BARNES, R. H .....Vice-President.
BOOTH, C. C.....Treasurer.
WHELAN, R. E.....Secretary.
MONTGOMERY, R. H.....Librarian.

MEMBERS.

Barnes, R. H.....Youngstown.
Bennett, J. G.....Hazelton.
Booth, C. C.....Youngstown.
Buechner, W. H.....Youngstown.
Campbell, Dan.....Canfield.
Clarke, M. S.....Youngstown.
Clarke, Ida.....Youngstown.
Cone, J. E. (Censor) .....Youngstown.
Dickson, J. A.....Youngstown.
Gibson, Robert D.....Youngstown.
Hawn, H. H.....Youngstown.
Kotheimer, J. B.....Youngstown.
McCurdy, John (Censor).....Youngstown.
Montgomery, R. H.....Youngstown.
Peck, Geo. S.....Youngstown.
Preston, J. F. (Censor).....Youngstown.
Schiller, A. W.....Greenford.
Stafford, W. C.....Youngstown.
Thomas, J. J.....Youngstown.
Werner, W. A.....Austintown.
Whelan, W. J.....Youngstown.
Whelan, Ray E.....Youngstown.
Woodbridge, J. E.....Youngstown.
Vogan, J. E.....Lowellville.
Yost, J. O.....Hazelton.

MARION COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1879. AFFILIATED 1892–93.

ANNUAL MEETING IN MAY.

THOMAS, FRANK W. ..... President.
HAMILTON, L. D. ..... Vice-President.
CRANE, A. MELVILLE. ..... Treasurer.
WEEKS, DANA O. ..... Secretary.

MEMBERS.

Britton, S. H. ..... Adelaide.
Crane, A. Melville. ..... Marion.
Denman, Wm. C. ..... Marion.
Dombaugh, Robert S. ..... Waldo.
Hamilton, L. D. ..... Marion.
Maddox, D. L. ..... Marion.
Martin, J. T. ..... Marion.
Mouser, J. A. ..... Larne.
Rhu, Auguste. ..... Marion.
Thomas, Frank W. ..... Marion.
Uhler, Harry L. ..... Marion.
Weeks, Oliver W. ..... Marion.
Weeks, Dana. ..... Marion.
Wells, W. S. ..... Marion.

MONTGOMERY COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1851. AFFILIATED 1892–93.

ANNUAL MEETING IN JANUARY.

BONNAR, HORACE.....President.
EVANS, G. B.....Vice-President.
STEIN, ROBT.....Secretary.
HUMPHREYS, C. H.....Treasurer.

MEMBERS.

Adams, P. N.....Dayton.
Barrere, D. M.....Dayton.
Bailey, V. M.....Dayton.
Bayliss, E. B.....Dayton.
Beck, J. S.....Dayton.
Boone, A.....Janton P. O.
Bonner, C. A.....Dayton.
Bonner, Horace.....Dayton.
Brown, R. L.....Dayton.
Collins, H. O.....Dayton.
Conklin, W. J. (Censor).....Dayton.
Corbin, Lee.....Dayton.
Crum, E. C. (Censor).....Dayton.
Davisson, E. C.....Dayton.
Dolina, T. E.....Dayton.
Evans, G. B.....Dayton.
Francis, O. E.....Dayton.
Geyer, John.....Dayton.
Goodhue, George.....Dayton.
Good, Horman.....Sulphur Grove.
Greene, D. W.....Dayton.
Gray, F. C.....Dayton.
Hahne, H. S.....Dayton.
Hecker, L. E.....Dayton.
Humphreys, C. H.....Dayton.
House, G. N.....Clayton.

Jennings, E.....Dayton.
Jenner, H. G.....Dayton.
Jewett, H. S.....Dayton.
Judy, C. S.....Miamisburg.
Keever, D. C.....Centerville.
Kimmell, H. S.....Dayton.
King, C. W.....Dayton.
Krause, S. S.....West Carrolton.
Lichliter, David C.....Dayton.
Marshall, W. C.....Trotwood.
Moist, Abraham R.....Dayton.
Myers, G. C.....Dayton.
Pettit, R. R.....Dayton.
Reeve, J. C. (Hon.).....Dayton.
Reeve, J. C., Jr.....Dayton.
Riley, W. H.....Vandalia.
Romspect, J. A.....Dayton.
Scheibenzuber, D. A.....Dayton.
Sims, Samuel C.....Dayton.
Souders, Samuel.....Dean P. O.
Stein, Robert.....Dayton.
Stonebarger, W. L.....Dayton.
Weaver, J. M. (Censor).....Dayton.
Weaver, W. P.....Miamisburg.
Williamson, A. M.....Dayton.

NORTH-CENTRAL OHIO MEDICAL SOCIETY.

AUXILIARY SINCE 1881. AFFILIATED 1892–93.

MEETINGS QUARTERLY.

BATTLES, W. L. ..... President.
HARDING, BENJ. F. ..... Secretary.
MCCOLLOUGH, A. H. ..... Treasurer.

MEMBERS.

Alban, S. M. ..... Perrysburg.
Armstrong, J. W ..... Mt. Vernon.
Battles, W. S. ..... Shreve.
Boles, R. S. ..... Lucas.
Budd, A. W. ..... Perrysburg.
Campbell, J. ..... Galion.
Clark, P. H. ..... Ashland.
Cowan, J. P. ..... Ashland.
Cowan, F. ..... Ashland.
Clouse, W. H. ..... Crestline.
Craig, J. H. ..... Mansfield.
Craig, J. W. ..... Mansfield.
Cullen, J. ..... Lucas.
Duncan, A. M ..... Bucyrus.
Erwin, J. W. ..... Ashland.
Erwin, N. B. ..... Gibsonburg.
Ewing, A. ..... Greenwitch.
Findlay, Mary ..... Mansfield.
Franks, F. S. ..... North Robinson.
Francis, D. R. ..... Mansfield.
Gibbons, H. B. ..... Tiffin.
Grubaugh, R. F. ..... Mansfield.
Hall, H. L. ..... Mansfield.
Harding, Benj. F. ..... Mansfield.
Harding, Frank. ..... Mansfield.
Hershiser, John S. ..... New Washington.
Hedges, J. S. ..... Mansfield.
Hise, A. H. ..... New Washington.
Inhoff, L. M. ..... Olivesburg.
Irwin, A. J. ..... Mansfield.
Kendig, W. C. ..... Haysville.
Kelley, H. R. ..... Galion.
Kelley, Webb. ..... Galion.

Kirshiser, J. S.....New Washington.
Kinnamon, R.....Ashland.
Latimer, R.....Newark.
Larimore, F. C.....Mt. Vernon.
Loughridge, Wm.....Mansfield.
McCollough, A. J.....Mansfield.
McMillan, D. C.....Mansfield.
Maglott, John.....Mansfield.
Mecklem, Wm. S.....Lucas.
Meyers, B.....Ashland.
Meyers, J. A.....Shelby.
Mitchell, George.....Mansfield.
Potter, L. B.....Fredrickstown.
Race, W. H.....Mansfield.
Reed, R. Harvey.....Mansfield.
Reinhart, W. H.....Polk.
Rhu, A.....Marion.
Russell, J. E.....Mt. Vernon.
Ruess, H.....Mansfield.
Sampsell, D. S., Sr.....Ashland.
Sampsell, D. S., Jr.....Ashland.
Schambs.....Mansfield.
Scott, A. J.....Londonville.
Scott, X. C.....Cleveland.
Sherrick, K. L.....Ashland.
Stoffer, C. C.....West Salem.
Stattler, J. M.....Ashland.
Stattler, G. P.....Povonia.
Stewart, J. P.....Mansfield.
Stoll, J. H.....Wooster.
Stofer, E.....Bellville.
Smith, D. B.....Cleveland.
Smith, H. H.....Lexington.
Sykes, W. H.....Plymouth.
Sykes, R. D.....Plymouth.
Tober, Wm.....Ashland.
Trimble, C. E.....Crestline.
Warner, C. J.....Congress.
Welker, G. A.....Ankingtown.
Wilson, E. J.....Mt. Vernon.
Wiles, Otis.....Mansfield.
Vance, R. A.....Cleveland.
Vorheis, L. B.....Mt. Gilead.

NORTH-WESTERN OHIO MEDICAL ASSOCIATION.

AUXILIARY SINCE 1869. AFFILIATED 1892–93.
ANNUAL MEETING IN DECEMBER.

KIRKLEY, C. A.....President.
EWING, FRANK.....First Vice-President.
HERMANN, S. S.....Second Vice-President.
GEHRETT, T. M.....Treasurer.
STEINER, D. W.....Secretary.

MEMBERS.

Alford, N. E.....Leipsic.
Anderson, W. V.....Toledo.
Archer, J. R.....North Baltimore.
Archer, J. D.....Holgate.
Ashton, E.....Lima.
Aris, Jas. F.....Toledo.
Bain, F. D.....Kenton.
Babcock, H. D.....South Toledo.
Baxter, S. A.....Lima.
Baldwin, J. F.....Bluffton.
Baker, J. P.....Findlay.
Bates, F. L.....Lima.
Barringer, D.....Rocky Ridge.
Bessey, J. M.....Toledo.
Belt, W. A.....Kenton.
Berlin, C.....Wapakoneta.
Beaghler, A. C.....Delphos.
Bener, C. T.....Tiffin.
Beardsley, C. E.....Ottawa.
Beardsley, C. O.....Ottawa.
Beggs, W. H.....Columbus.
Beckwith, S. W.....Toledo.
Bird, E. H.....Dupont.
Bishop, S. P.....Delta

Blaine, H. G.....Toledo.
Becker, Bernhart.....Toledo.
Blizzard, J. W.....Ft. Recovery.
Bloomfield, John.....Napoleon.
Bland, J.....Bucyrus.
Bond, J. W.....Toledo.
Bowen, Geo. W.....Toledo.
Bowman, C. F.....Coldwater.
Bowers, I. S.....Perrysburg.
Bowers, A. D.....West Sodi.
Bodman, L. H.....Toledo.
Bowman, C. F.....Coldwater.
Brayton, W. G.....Arcadia.
Bradley, J.....St. Marys.
Brunthaver, Frank.....Dowling.
Brundage, S. P.....Wapakoneta.
Brewington, W. J.....St. Marys.
Bowles, A. D.....West Liberty.
Brigham, O. S.....Toledo.
Bricker, W. R.....Shelby.
Bricker, J. W.....Fostoria.
Bringkerhoff, D. H.....Fremont.
Brayton, A.....Carey.
Brooks, P. H.....Lima.
Brown, H. H.....Lyons.
Burritt, W. H.....South Toledo.
Burton, E. J.....West Minister.
Byal, W. A.....Findlay.
Campbell, L. W.....Ada.
Caples, R. C.....Fostoria.
Caldwell, Wm.....Fremont.
Campbell, J. C.....Spencerville.
Carey, M. J.....Woodville.
Caruthers, M. M.....Findlay.
Calvin, J. H.....Huron.
Cessna, B. F.....Kenton.
Cherry, Wm.....Toledo.
Chapman, W. C.....Toledo.
Chamberlin, D. P.....Toledo.
Chesney, W. M.....Kenton.
Chesney, John A.....Bucyrus.
Chilcote, C. H.....Blairdstown.
Clippinger, J. S.....West Cairo.

Clark, J. R.....Bluffton.
Clark, C. F.....Findlay.
Clevenger, A. E.....North Washington.
Collamore, Geo. A.....Toledo.
Cosgrove, Thomas.....Toledo.
Cole, W. C.....Mendon.
Costello, J. W.....Loramie.
Croaks, R. L.....Convoy.
Craver, Belle S.....Bryan.
Creps, A. H. (removed).....Toledo.
Curry, John H.....Toledo.
Curtis, C. L.....Lima.
Day, Hiram.....Pendleton.
Davis, John.....Van Wert.
Day, H. M.....Pandora.
Davis, Samuel.....Waterville.
Devilbiss, Allen.....Toledo.
Deiner, H. E.....Vickery.
DePuy, W. W.....Van Wert.
Dickey, W. A.....Tiffin.
Dine, C. L.....Minister.
Donnelly, Jas.....Toledo.
Donoway, J. C.....Deshler.
Dreitzler, Wm.....Findlay.
Durlesin, R. M.....Hessville.
Duncan, A. M.....Hamler.
Durbin, R. M.....Hessville.
Eakin, T. E.....Columbus Grove.
Ellis, R. A. (removed).....Findlay.
Evans, J. R.....Delphos.
Estill, J. A.....Rockford.
Evans, J. B.....Ada.
Ewing, M. Jay.....Findlay.
Ewing, F.....West Cairo.
Faber, C. A.....Toledo.
Fisher, A. W.....Toledo.
Fisher, W. H.....Toledo.
Firmin, F. W.....Findlay.
Forbes, S. F.....Toledo.
Foster, John.....Mt. Blanchard.
Foltz, T. H.....Lima.
Foster, Thomas.....Carey.
Gardner, John.....Toledo.

Gardiner, W. G.....Toledo.
Gehrett, T. M.....Deshler.
George, E.....Van Buren.
Gillette, W. J.....Toledo.
Gival, Frank.....Fremont.
Gibbon, H. B.....Tiffin.
Ginn, A. P.....Fremont.
Glenn, G. C.....Van Wert.
Goeble, Anna M.....Lima.
Godfrey, C. M.....Ottawa.
Graefe, Chas.....Sandusky.
Green, C. S.....Fostoria.
Groval, F.....Fremont.
Guise, J. M.....Findlay.
Guise, P. O.....Findlay.
Hathaway, H.....Toledo.
Harper, W. H.....Lima.
Hale, R. W.....Fostoria.
Haag, D. E.....Liberty Center.
Hamilton, H. A.....Perrysburg.
Hawkins, T.....Wellshire.
Haines, J. B.....Mendon.
Havighorst, H. S.....Toledo.
Hattery, J. E.....Elgin.
Hartman, G. W.....Archibald.
Hasencamp, O.....Toledo.
Harrisen, E. B.....Napoleon.
Heistand, E. B.....Kenton.
Heller, Thomas F.....New Washington.
Henry, A. G.....North Baltimore.
Heckerman, J. V.....Tiffin.
Heller; J.....Grand Rapids.
Hoy, B. F.....Belmore.
Hetrick, J. S.....North Washington.
Hermann, S. S.....Lima.
Heckerman, J. U.....Tiffin.
Heller, F. S.....Oak Harbor.
Henderson, George W.....Vaughansville.
Heard, E. N.....Sandusky.
Hiner, S. B.....Lima.
Hickey, W. H.....Leipsic.
Hixon, M. M.....Dupont.
Higbie, J. G.....Jenneria.

Hill, W. W.....Weston.
Higgins, C. W.....Toledo.
Hoege, G. L.....Fostoria.
Hoover, W. E.....Lima.
Howell, J. A.....Findlay.
Hoag, W. P.....Liberty Center.
Hoy, B. F.....Belmore.
Huber, H.....Ottawa.
Hubbard, Thomas.....Toledo.
Hurd, A.....Findlay.
Hutchinson, J. H. S.....Ada.
Jenner, A. B.....Findlay.
Jenner, C. W.....Crestline.
Jewell, N. M.....Wauseon.
Jones, C. P.....Nevada.
Jones, W. A.....Antwerp.
Jones, R. E.....Gomer.
Kahle, A. W.....Lima.
Kahle, R. D.....Lima.
Keller, T. F.....North Washington.
Kinmont, F. C.....Hicksville.
Kishler, W. G.....St. Marys.
Kitchen, F. A.....Toledo.
Kirkley, C. A.....Toledo.
Krebs, W. J.....Waynesfield.
Lawless, J. T.....Toledo.
Lathrop, A. B.....Swanton.
Ladd, L. E.....Middlepoint.
Lafferty, A. B.....Arlington.
Lander, W. L.....North Baltimore.
Ladd, F. B.....Broughton.
Landrick, L. F.....Lima.
Landman, Otto.....Toledo.
Leran, D. H.....Mt. Victory.
Lenhardt, P. J.....Wauseon.
Leonard, B. B.....West Liberty.
Leonard, B. S.....West Liberty.
Lininger, A. J.....Mendon.
Light, Frank.....Ottawa.
Liners, F. J.....Tiffin.
Lisle, J. M.....Celina.
Longsworth, W. N.....Van Wert.
Longfellow, A. J.....Fostoria.

Long, J. W.....Bryan.
Lynch, Wm.....Rockfort.
McClung, J. C.....Leipsic.
McLoughlin, C. C.....Dunkirk.
McCleod, J. R.....Benton.
McCoy, Clem. D.....Kenton.
McClaren, A.....North Baltimore.
McClure, T. R.....Medges.
McCullan, E. J.....Tiffin.
McConnel, D. W.....Marseilles.
McGovern, G. W.....Van Wert.
McMillan, A.....Genoa.
McKinley, E. B.....Vaughnsville.
McKellar, A. R.....Green Spring.
Martin, E. T.....Liberty Center.
Martin, J. C.....Findlay.
Mauk, E. B.....Malinta.
Matthias, C. E.....Gilboa.
Maerker, A. E. H.....Napoleon.
Manville, A. J.....Bowling Green.
Mann, H. E.....Colton.
Merz, Chas. H.....Sandusky.
Meyers, A. H.....Carey.
Miller, W. L.....Findlay.
Miller, J. M.....Chattanooga.
Miller, C. S.....Toledo.
Mills, C. H.....Toledo.
Miley, L. E.....Wauseon.
Miley, L. E.....Wauseon.
Morris, Jos.....Columbus Grove.
Montgomery, H. B. B.....Gilboa.
Mumaugh, Shelby.....Lima.
Munson, A. W.....Kenton.
Munn, H. E.....Toledo.
Murback, A. J.....Archibald.
Newman, J. E.....Gilboa.
Neville, J. W.....Round Head.
Noble, N. T.....St. Marys.
Noble, H. E.....Stony Ridge.
Nolen, J. G.....Toledo.
Norris, M. M.....Fostoria.
North, John.....Toledo.
Nichols, J. H.....Wapakoneta.

Nuding, W. H.....New Bremen.
Paul, T. E.....Ottawa.
Paul, W. H.....Adrian.
Parrott, D. F.....Mendon.
Pency, Leroy.....Celina.
Philps, C. H.....St. Marys.
Potts, Charles N.....Lima.
Pontius, C. R.....Fremont.
Pollock, S. J.....New Hampshire.
Protzman, L.....Kenton.
Pugh, F. H.....Toledo.
Radebaugh, P.....Hestor.
Reiff, C. F.....Fremont.
Reinfrank, J. H.....Perrysburg.
Reed, W. F.....Kalida.
Reed, E. J.....Leipsic.
Reed, C. H.....Toledo.
Reinhart, J. C.....Toledo.
Remeker, A. P.....Maria Stein.
Rhu, August.....Marion.
Rice, Robert H.....Fremont.
Richardson, D. H.....Celina.
Richardson, J. V.....Ft. Recovery.
Reid, J. L.....Van Wert.
Reid, C. B.....Van Wert.
Ridenour, W. T.....Toledo.
Richey, J. A.....Oceola.
Ried, Chas.....Hestor.
Richardson, E. O.....Bowling Green.
Roat, H. A.....Toledo.
Road, M. N.....Mt. Cory.
Rogers, J. A.....Kenton.
Rush, D.....Celina.
Rudy, A. L.....Lima.
Sager, J.....Celina.
Sager, N., Jr.....Herring.
Sauer, P. B.....Napoleon.
Saxauer, C. F.....North Robinson.
Schnetzler, H. M.....Toledo.
Schlink, F. H.....Delphos.
Shaffner, J. F.....Wilshire.
Shoemaker, J. M.....Napoleon.
Sherrard, A. C.....Oakwood.

Skinner, S. W. ..... Toledo.
Slagen, J. L. ..... Paulding.
Smith, Wm. ..... Van Wert.
Smith, W. M. ..... Van Wert.
Smith, C. H. ..... Kenton.
Smith, D. C. ..... Dunkirk.
Smith, C. N. ..... Toledo.
Small, W. W. ..... Middleport.
Souder, R. L. ..... Nevada.
Speece, N. V. ..... Quincy.
Squirr, J. B. ..... Sulphur Springs.
Stutsman, J. M. ..... Van Wert.
Stemen, H. G. ..... Delphos.
Stancell, J. A. ..... Forest.
Stewart, J. M. ..... Oak Harbor.
Stamm, M. ..... Fremont.
Steiner, D. W. ..... Lima.
Steuber, F. G. ..... Lima.
Steuber, L. J. ..... Lima.
Stewart, W. D. ..... Toledo.
Stevens, M. B. ..... Defiance.
Swimley, W. A. ..... Kenton.
Snodgrass, J. ..... Kenton.
Tapper, C. E. ..... Ottawa.
Terwillinger, T. ..... Lima.
Thrift, J. D. ..... Columbus Grove.
Thorn, S. S. ..... Toledo.
Thrift, R. W. ..... Lima.
Thacker, L. G. ..... Defiance.
Thompson, C. M. ..... Holgate.
Thomas, O. H. ..... Fremont.
Thomson, John C. ..... Rollersville.
Thorne, Geo. L. (deceased) ..... Toledo.
Tobey, H. A. ..... Toledo.
Townsend, J. ..... Holgate.
Touville, S. W. ..... Celina.
Todd, F. A. ..... Toledo.
Travis, A. J. ..... Spencerville.
Tracy, J. L. ..... Toledo.
Tuller, W. M. ..... Bowling Green.
Tupper, C. E. ..... Ottawa.
Vail, Jonathan B. ..... Lima.
Van Pelt, Chas. L. ..... Toledo.

Virtue, F. M.....Sulphur Springs.
Wadsworth, Miner.....Hoytesville.
Ward, C. L.....Cridersville.
Wagar, C. P.....Toledo.
Waddick, J. M.....Toledo.
Wagoner, H. P.....Delphos.
Walters, J. W.....Ada.
Walker, R. J.....Bucyrus.
Walters, R. L.....Lake Side.
Wert, L. J.....Tiffin.
Wegg, John E.....Lima.
Wetherill, I. R.....Bluffton.
Weadock, T. M.....Lima.
West, T. J.....Tiffin.
West, M. O.....Mexico.
Willett, R. A.....Elmore.
Wintermute, G. J. C.....Elmore.
Wilson, S. R.....Wabash.
Wilson, W. P.....Van Loo.
Williamson, M. S.....Findlay.
Williard, G. P.....Tiffin.
Willet, P.....Elmore.
Williams, F. S.....Kalida.
Wilkins, J. A.....Delta.
Williams, A. S.....Fostoria.
Wilkinson, E. L.....Van Wert.
Wood, W. I.....Lima.
Woods, Jos. T.....Toledo.
Wood, W. F.....New Bremen.
Wood, F. E.....Rawson.
Woodward, George.....Oak Harbor.
Woods, J. K.....Van Wert.
Wright, John A.....Toledo.
Yingling, G. S.....Tiffin.
Young, P. B.....Crestline.
Yost, W. N.....Mt. Blanchard.
Yoder, S. S.....Lima.
Zetlitz, Arne.....Toledo.
Ziegler, H. H.....Ayersville.
Zulch, G.....New Knoxville.
Zopfi, W. J.....Findlay.

PIQUA SOCIETY OF CLINICAL MEDICINE.

AUXILIARY SINCE 1886. AFFILIATED 1892–93.

ANNUAL MEETING IN JANUARY.

PARKER, W. S.....President.
SMITH, S. D.....Vice-President.
LOWE, J. H.....Secretary.
SHELLENBERGER, JAS. E.....Treasurer.

MEMBERS.

Alff, Louis.....Piqua.
Ashton, A. S.....Piqua.
Frame, A. B.....Piqua.
Gabriel, J. F.....Piqua.
Gray, S. S.....Piqua.
Lowe, J. H.....Piqua.
Neglespach, Otto.....Piqua.
O'Ferrall, R. M.....Piqua.
Parker, W. S.....Piqua.
Shellenberger, Jas. E.....Piqua.
Smith, S. D.....Piqua.
Tydings, O.....Piqua.
Unkefer, W. W.....Piqua.

PORTAGE COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1869. AFFILIATED 1892–93.

ANNUAL MEETING IN JUNE.

PORTER, C. H.....President.
SPIERS, H. H.....Vice-President.
LEONARD, C. L.....Treasurer.
WAGGONER, GEO. J.....Secretary.

MEMBERS.

Applegate, F. C.....Windham.
Hiddleson, C. L.....Atwater Station.
Leonard, C. L.....Ravenna.
Jenkins, Wm. (dropped).....Palmyra.
Proctor, G. M.....Shalersville.
Price, J.....Randolph.
Price, E. W.....Kent.
Porter, C. H.....Roodstown.
Reardon, David.....Mantua.
Sloan, Seth L.....Freedom Station.
Smith, W. G.....Ravenna.
Sherman, A. M.....Kent.
Spiers, H. H.....Ravenna.
Warrington, E.....Atwater.
Waggoner, J.....Ravenna.
Waggoner, Geo. J.....Ravenna.

SHELBY COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1852. AFFILIATED 1892–93.

ANNUAL MEETING IN DECEMBER.

SHARP, B. M.....President.
GROSVENOR, A. W.....Vice-President.
HUSSEY, M. F.....Secretary.
JOHNSON, C. E.....Treasurer.

MEMBERS.

Beeman, Park.....Sidney.
Cable, Thomas B.....Pemberton.
Carter, J. M.....Jackson Center.
Costello, J. W.....Loramie.
Dine, C. L.....Minister.
Driscoll, P.....Sidney.
Geyer, J. D.....Sidney.
Getzlaff, Bruno.....Botkins.
Grosvenor, A. W.....Hardin.
Hamsher, J. F.....Tawawa.
Harbour, W. H.....Anna.
Hollopeter, Jas. F.....Houston.
Hussey, M. F.....Sidney.
Johnson, C. E.....Sidney.
LeFevre, Ed.....Sidney.
Milholland, Wm.....Sidney.
Miller, J. F.....Port Jefferson.
Parent, W. H.....Lockington.
Sharp, B. M.....Sidney.
Silver, David R.....Sidney.
Tate, G. M.....Botkins.

SUMMIT COUNTY MEDICAL AND SURGICAL SOCIETY.

AUXILIARY SINCE 1886. AFFILIATED 1892–93.

ANNUAL MEETING IN JANUARY.

FOLTZ, A. E.....President.
SEILER, J. H.....Secretary.
THEISS, H. C.....Treasurer.

MEMBERS.

Bower, F. J.....Mogadore.
Cleaver, J. V.....Akron.
Conn, Eli.....Akron.
Davison, C. C.....Akron.
Ebright, L. S.....Akron.
Fisher, H. M.....Akron.
Foltz, A. E.....Akron.
Fouser, A. K.....Akron.
Hitchcock, E.....Akron.
Hoover, Albert.....Akron.
Hough, W. S.....Cuyahoga.
Lee, J. L.....Akron.
McEbright, Thos.....Akron.
Millikin, C. W.....Akron.
Russell, F. B.....Suffield.
Taggart, H. D.....Akron.
Theiss, H.....Akron.
Woods, A. T.....Royal Oak.
Wright, S. J.....Tallmadge.

TOLEDO MEDICAL ASSOCIATION.

AUXILIARY SINCE 1857. AFFILIATED 1892–93.

ANNUAL MEETING IN JANUARY.

TRACY, JAMES L.....President.
HUBBARD, THOMAS.....Vice-President.
LANDMAN, OTTO.....Secretary.
COLLAMORE, GEO. A.....Treasurer.
BESSEY, J. MORTIMER.....Cor. Secretary.
THORN, SAMUEL S.....Librarian.

MEMBERS.

	TOLEDO.
Aris, James F.....	...1321 Washington Street.
Beckwith, S. W.....	.....145 Bridge Street.
Becker, Bernard.....	.....319 Washington Street.
Bessey, J. Mortimer.....	.....1814 Adams Street.
Bodman, Louis H.....	.....Jefferson and 22d Streets.
Bond, John W.....	.....Vermont Avenue.
Brigham, Oshea S.....	.....1704 Washington Street.
Brewer, Lyman A.....	.....625 Adams Street.
Chamberlin, David P.....	.....314 Jefferson Street.
Cherry, Wm.....	.....1314 Cherry Street.
Chapman, Wm. C.....	.....1710 Madison Street.
Collamore, Geo. A.....	.....132 Eleventh Street.
Coldham, W. W.....	.....336 Michigan Street.
Cosgrove, Thos.....	.....Auburndale, Monroe Street.
Curry, John H.....	.....713 Madison Street.
Darst, Henry H.....	.....1214 Madison Street.
Devilbiss, Allen.....	.....Warren Street.
Donnelly, Jas.....	.....722 Washington Street.
Duncan, James A.....	.....1107 Broadway.
Faber, Chas. A.....	.....2014 Adams Street.
Fella, F. J.....	.....613 S. St. Clair Street.
Fisher, Albert W.....	.....815 Erie Street.
Fisher, W. A.....	.....815 Erie Street.

TOLEDO.

Forbes, Samuel F.....113 Superior Street.
Gifford, Wm. R.....2005 Adams Street.
Gillette, Wm. J.....705 Madison Street.
Haynes, J. Purcell.....1125 Washington Street.
Hathaway, Harrison.....1233 Miami Street.
Hasencamp, O.....Cherry and Michigan Streets.
Heydrick, L. W.....Washington and Eleventh Streets.
Hubbard, Thomas.....205 Ontario Street.
Kirkley, Cyrus A.....1105 Jefferson Street.
Kitchen, Francis A. .....2137 Jefferson Street.
Landman, Otto.....Pythian Castle.
Lawless, James T.....1205 Broadway.
Lilly, J. W.....631 Division Street.
McInnes, J. P.....1619 Broadway.
North, John. .....321 Superior Street.
Reed, Calvin H.....324 Logan Street.
Reinhart, Jas. C.....1519 Broadway.
Root, Henry A.....413 Superior Street.
Root, Aaron D.....427 Huron Street.
Roulet, Charles.....1418 Cherry Street.
Schnetzler, H. Marcus.....726 Huron Street.
Smith, C. N.....1921 Franklin Avenue.
Stewart, W. D.....1307 Superior Street.
Thorn, Samuel S.....506 Lagrange Street.
Thorn, Geo. L......
Tracy, James L.....1708 Adams Street.
Tobey, Henry A.....Toledo Asylum.
Todd, F. H.....Toledo Asylum.
Wagar, Charles P.....Hotel Madison.
Walker, Hattie Davis.....Vermont Avenue.
Woods, Elizabeth.....329 Huron Street.
Woods, Joseph T.....Summit and Jefferson Streets.
Van Pelt, Charles L..Nineteenth and Jefferson Streets.

TUSCARAWAS COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1851. AFFILIATED 1892–93.

ANNUAL MEETING IN APRIL.

GROVES, J. E.....President.
SMITH, T. H.....Vice-President.
MILLER, A. T.....Treasurer.
MCCOLLAM, J. A.....Secretary.

MEMBERS.

Beers, A. M.....Newcomerstown.
Brannan, T. H.....Canal Dover.
Blickensderfer, Jos.....New Philadelphia.
Groves, J. E.....Uhrichsville.
Gooding, J. J.....Gilmore.
Goudy, J. W. S.....Newcomerstown.
Haverfield, J. W.....Uhrichsville.
Hendershot, B. C.....New Philadelphia.
Hughs, L. H.....Dennison.
McCurdy, S. L.....Dennison.
McLean, J. T.....New Philadelphia.
McCaluey, F. W.....Uhrichsville.
McKean, Wm.....Dundee.
McCollam, J. A.....Uhrichsville.
Miller, A. T.....Shanesville.
Otis, J. D.....New Philadelphia.
Peter, Robert.....Canal Dover.
Richards, T. J. W.....New Philadelphia.
Russell, E. S.....Tuscarawas.
Smith, T. H.....Tuscarawas.
Smith, J. M.....Tuscarawas.
Sawyer, C. H.....Mineral Point.
Shutzback, J. C.....Strasburg.
Thompson, S. R.....Uhrichsville.
Welty, O. S.....Canal Dover.
Wilson, T. H.....Dennison.

WAYNE COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1850. AFFILIATED 1892–93.

ANNUAL MEETING IN APRIL.

BATTLES, WM. S.....President.
BARRETT, JOS. E.....Secretary.
LIGGETT, GEO.....Treasurer.

MEMBERS.

Battles, Wm. S.....Shreve.
Barrett, Jos. E.....Wooster.
Beer, Jas. D.....Wooster.
Ferguerson, J. W.....Canaan.
Greenmeier, P. S.....Smithville.
Hart, Hugh A.....Wooster.
Lerch, Chas.....Wooster.
Liggett, Geo.....Wooster.
Robinson, Jas. D.....Wooster.
Stull, J. H.....Canaan.
Taggart, W. W.....Wooster.
Todd, Jos. H.....Wooster.

AUXILIARY SOCIETIES,

NOT INCLUDED IN LIST OF AFFILIATED SOCIETIES.

ASHLAND COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1865. ANNUAL MEETING IN MAY.

COWIN, J. P.....Presiden
CLARK, P. H.....Vice-President.
KINNAMAN, R. C.....Secretary.
SAMPSEL, D. S.....Treasurer.

MEMBERS.

Ash, L. B.....Ashland.
Budch, A. W.....Perrysville.
Campbell, John.....Galion.
Clark, P. H.....Ashland.
Cowin, F.....Ashland.
Cowin, J. P.....Ashland.
Crowell, David.....Savannah.
Davis, L. Z. (Censor).....Jeromesville.
Francis, D. R.....Mansfield.
Fuller, A. B.....Londonville.
Gregg, George.....Rows.
Hunter, Thos. S.....Ashland.
Irwin, J. W.....Ashland.
Johnson, J.....Perrysville.
Kendig, E. V. (Censor).....Haysville.
Kinnaman, A. S.....Cleveland.
Kinnaman, C. L.....Cleveland.
Kinnaman, R. C.....Ashland.
McCarty, O. C.....Ashland.
Myers, Benj.....Ashland.
Parr, G. W.....Perrysville.
Sampel, D. S., Jr.....Ashland.
Sampel, D. S., Sr.....Ashland.
Sampel, W. H.....Ashland.
Scott, A. J. (Censor).....Londonville.
Shorick, A. L.....Ashland.
Wirt, Wm. H.....Londonville.
Stoll, J. H.....Wooster.
Willson, J. H.....Pittsburg.

CLARKE COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1877.
ANNUAL MEETING IN MAY.

KENNAN, J. G.....President.
TITLOW, B. G.....First Vice-President.
ROGERS, J. H.....Second Vice-President.
SMITH, W. A.....Secretary and Treasurer.

MEMBERS.

Baldwin, Henry.....Springfield.
Bell, R. L.....Springfield.
Bruberbaker, G. D. .....Springfield.
Buckingham, J. M.....Springfield.
Carroll, T. M.....Springfield.
Collins, M. H.....South Charleston.
Davis, Ben.....North Carlisle.
Deane, J. W.....Donnellsville.
Dugan, J. P.....Springfield.
Gilbert, I. K.....North Carlisle.
Hall, W. W.....Springfield.
Harris, E. C.....Springfield.
Hebble, D. W.....Enon.
Hirons, J. B.....Tremont.
Hockman, B. F.....Springfield.
Hulick, J. W .....Springfield.
Kay, C. H.....Springfield.
Kay, I.....Springfield.
Kennan, J. G.....Springfield.
Kuglor, J. G.....North Carlisle.
Lisle, J. D.....Springfield.
McClintock, A.....North Moorfield.
Morrison, J. W.....Springfield.
Myers, J. E.....Springfield.
Myers, Noah.....Springfield.
Nelson, J. W .....Springfield.
O'Neil, J. M. (removed).....Springfield.
Ramsey, M. (removed).....Springfield.
Reade, T. M.....Springfield.
Reigle, Frank L.....Tremont.
Rogers, J. H.....Springfield.
Seys, H. H.....Springfield.
Smith, W. A.....Springfield.
Smith, E. H.....Vienna.
Titlow, B. G.....Springfield.

CLINTON COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1879.

ANNUAL MEETING IN MAY.

MEMBERS.

Adams, C. F.....Sabina.
Austin, G. M.....Wilmington.
Bowers, J. F.....Port William.
Briggs, E.....Wilmington.
Conard, G. R.....New Vienna.
Donaldson, D. F.....Port William.
Garland, J. S.....Clarksville.
Garland, Z. T.....Clarksville.
Lightner, S. B.....Sabina.
McFadden, John.....Centerville.
McKenzie, J. B.....Wilmington.
Martin, A. J.....Wilmington.
Moon, S. B.....Wilmington.
Mory, D. B.....Wilmington.
Mory, D. B., Jr.....Wllmington.
Quinn, A. T.....Wilmington.
Quinn, T. C.....New Vienna.
Savage, T. J.....(Green) Bowersville.
Sheppard, W. W.....Wilmington.
Telfair, G. M.....Bloomington.
Trimble, R. T.....New Vienna.
VanWinkle, N. B.....Blanchester.
Welch, Chas.....Wilmington.
Whistle, H.....New Antioch.
Wilkinson, M.....Sabina.
Wire, G. W.....Wilmington.

COLUMBUS MEDICAL CLUB.

AUXILIARY SINCE 1885.

SEMI-ANNUAL MEETING, IN MAY AND DECEMBER.

WHITE, G. M.....President.
WRIGHT, J. W.....Secretary.

MEMBERS.

Adams, D. P.....Columbus.
Baldwin, J. F.....Columbus.
Dick, W. L.....Columbus.
Gerhart, J. H.....Sunbury.
Guerin, L. T.....Columbus.
Hoglan, Geo. W.....Columbus.
Homes, W. W.....Columbus.
McKinley, L. W.....Columbus.
Matthews, R. C.....Columbus.
Montgomery, C. R.....Columbus.
Nash, W. H. H.....Columbus.
Rowles, W. T.....Columbus.
Wagenhalls, F. S.....Columbus.
Wissinger, T. K.....Columbus.
Whitten, Wm.....Columbus.
White, G. M.....Columbus.
Wright, J. W.....Columbus.

GEAUGA COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1882.

ANNUAL MEETING IN APRIL.

MERRIMAN, DAVID J.....President.
CLAPP, F. S.....Vice-President.
POMEROY, O.....Treasurer.
WARNER, ALBERT D.....Secretary.

MEMBERS.

Chapel, E. S.....East Claridon.
Clapp, F. S.....East Claridon.
Cheilester, C. B.....Erie, Pa.
Dimmick, O. A. (Censor).....Charidon.
Fairbanks, W. F.....Montville.
Fenton, H. M.....Welshfield.
LaDow, W. E.....Fullerton.
LeRoy, Bernard R.....Chagrin Falls.
Merriman, David J.....Painesville.
Pomeroy, Frank L.....Charidon.
Pomeroy, Orange (Censor).....Charidon.
Proctor, D. G.....Thompson.
Sager, C. W.....Middlefield.
Stickland, Wesley.....Burton.
Warner, Albert D. (Censor).....Burton.

HILDRETH DISTRICT MEDICAL ASSOCIATION.

AUXILIARY SINCE 1886.

ANNUAL MEETING IN JANUARY.

SPEAR, A. T.....President.
MCDOUGAL, J. G.....First Vice-President.
RUSK, DANIEL.....Second Vice-President.
MCCURDY, S. L.....Third Vice-President.
CROSSLAND, J. C.....Fourth Vice-President.
PATRICK, N. E.....Secretary.

MEMBERS.

Alexander, J.....McConnellsville.
Axline, C. Z.....Fultonham.
Axline, J. D.....Shawnee.
Bell, A. E.....Zanesville.
Carr, J. G.....Coshocton.
Calvin, R. A.....Avondale.
Carr, E. A.....Coshocton.
Cass, Edw.....Dresden.
Clemson, G. W.....Thornville.
Crossland, J. C.....Zanesville.
Davis, M. B.....Rossean.
Davis, T. J.....Zanesville.
Davis, Jas.....Ringgold.
Bingham, T. J.....McConnellsville.
Brush, E. C.....Zanesville.
Barcroft, W. H.....Coshocton.
Bugher, C. E.....Caldwell.
Emory, G. A.....Rendville.
Fassig, J. M.....Zanesville.
Folk, P.....Deavertown.
Frew, W. C. (Censor).....Coshocton.
Gue, V. H.....New Lexington.
Geyer, J. L.....Norwich.
Gordon, P. A.....Junction City.
Hays, J. D.....Somerset.
Halderman, J. H.....Zanesville.

Halstone, J. G. F.....Zanesville.
Holden, J. L.. .....Zanesville.
Holcomb, L. S.....Pennsville.
Holland, G. H.....Mt. Perry.
Humphrey, J. B.....Malta.
Jones, W. T.....Columbus.
Kennedy, G. L.....Deavertown.
Kemmerer, F. M.....Crooksville.
King, C. P.....Newark.
Kyle, G. G.....Granville.
Larue, F.....Chandlersville.
Larimore, J.....Newark.
Lenhart, C. M.....Zanesville.
Lenhart, W.....Columbus.
Lerone, L. W.....Hebron.
Logsdon, E. C.....Zanesville.
McCurdy, S. L.....Dennison.
McDougal, J. G.....New Lexington.
McTagne, N. T.....New Lexington.
Mellick, W. A.....Zanesville.
Moody, I. A.....Junction City.
Newton, G. A.....New Straitsville.
Noyes, H. J.....Mergsville.
Norman, A. M.....Roseville.
O'Neil, J. M.....Zanesville.
Patrick, N. E.....Zanesville.
Priest, S. C.....Newark.
Reamy, L. M.....Zanesville.
Reed, R. Harvey.....Mansfield.
Richards, A.....New Lexington.
Rusk, Daniel.....Malta.
Shipp, G. Linton.....Newark.
Snider, J. W.....New Castle.
Snyder, D. P.....New Bedford.
Sheppard, H. P.....Adams Mills.
Speer, A. T.....Newark.
Thomas, B. A.....Rushville.
Tracey, E. G.....Malta.
Walker, G. W. W.....Roseville.
Woodworth, O. M.....Corning.
Wiseman, O. M.....Zanesville.
Wright, N. (Censor).....Moundsville.
Yarnell, F. H.....West Lafayette.

HOLMES COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1869.

ANNUAL MEETING IN JANUARY.

GUITTARD, F. J.....President.
OLMSTEAD, D. S.....Secretary and Treasurer.

MEMBERS.

Blair, A. S.....Winesburg.
Brigham, John G.....Millersburg.
Carson, F. D.....Benton.
Crump, A. A., Jr.....Millersburg.
Crump, A. A., Sr.....Millersburg.
Elder, W. T.....Nashville.
Grotthouse, W. H .....Millersburg.
Guittard, A. M.....Killbuck.
Guittard, F. J.....Killbuck.
Hoover, A. M.....Nashville.
Jones, A. L.....Black Creek.
Jones, H. S.....Clarks.
Loller, R. P.....Holmesvile.
Most, Jacob A.....Walnut Creek.
Olmstead, D. S.....Millersburg.
Pomerne, Joel.....Mt. Hope.
Pomerne, H. P.....Berlin.
Pomerne, Lister.....Berlin.
Shalliol, P.....Winesburg.
Snyder, S. P.....New Bedford.
Stuckey, A. C.....Walnut Creek.
Webb, M. P.....Nashville.
Whitmar, J. E.....Millersburg.
Wise, S. P.....Millersburg.
Wilson, T. R.....Clarks.

JEFFERSON COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1859.

ANNUAL MEETING IN NOVEMBER.

WHITE, D. K.....President.
ELLIOTT, A. A.....Secretary.

MEMBERS.

Blackburn, A. M.....Steubenville.
Bozeman, H. E.....New Alexandria.
Collins, J. W.....Toronto, O.
Elliott, A. A.....Steubenville.
Floyd, J. C. M.....Steubenville.
Fisher, B. H.....Steubenville.
Gregg, Melvin.....Knoxville.
Nelson, H. W.....Steubenville.
Pearce, E.....Steubenville.
Robertson, J. W.....Steubenville.
White, Leonidas.....Wintersville.
White, D. K.....Richmond.
Wood, W. H.....Smithfield.
Whittaker, J. F.....Bloomingdale.

LICKING COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1877.

ANNUAL MEETING IN DECEMBER.

MEMBERS.

Alexander, J. W .....Newark.
Allen, P. C.....Utica.
Black, J. R.....Newark.
Brooke, J. H.....Newark.
Brown, E. S.....Newark.
Carter, W. W.....Newark.
Davis, W. C.....Granville.
Follett, A.....Granville.
Garrison, G. W.....Utica.
Hedrick, C. W.....Newark.
Hughes, E. J.....Newark.
King, C. P.....Newark.
Kyle, G. G.....Granville.
Larimore, J.....Newark.
Lecrone, L. W.....Hebron.
Mattingly, J. H.....Newark.
Priest, S. C.....Newark.
Rankin, T. W.....Kirkersville.
Rogers, J.....Utica.
Sinnett, E.....Granville.
Speer, A. T.....Newark.
Shipp, G. L.....Newark.
Spencer, B. F.....Newark.
Wotring, J.....Newark.

MEIGS COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1850.

ANNUAL MEETING IN OCTOBER.

ROUSH, L. F.....President.
HOFF, J. W.....Vice-President.
ARD, W. E.....Secretary.

MEMBERS.

Ard, W. E.....Pomeroy.
Barton, T. H.....Syracuse.
Carlton, J. S.....Long Bottom.
Crary, Arch.....Hartford City.
Day, H.....Harrisonville.
Day, S.....Harrisonville.
Deem, S. P.....Tupper's Plains.
Hoff, J. W.....Pomeroy.
Hysell, J. H.....Pomeroy.
Knight, A. L.....West Columbus (W. Va.)
Miller, J. A.....Chester.
Pake, Jas. H.....Middlefort.
Rathburn, D. C.....Middlefort.
Reed, C. R.....Middlefort.
Rine, E. W.....Long Bottom.
Roush, L. F.....New Haven (W. Va.)
Russell, J. N.....Mason City (W. Va.)
Stobert, R. E.....Pomeroy.
Stanley, A. A.....Rutland.
Thomas, L. A.....Middlefort.
Titus, J. M.....Chester.

MIAMI COUNTY MED.-CHIR. SOCIETY.

AUXILIARY SINCE 1851.

ANNUAL MEETING IN FEBRUARY.

MEMBERS.

Brandon, J. P.....Laura.
Calvin, J. W.....Troy.
Camitz, Charles.....Casstown.
Coleman, Warren.....Troy.
Deahofe, S. P.....Pottsdam.
Deahofe, Nora H.....Pottsdam.
Deaton, Van S.....Albany.
Evans, J. R.....Troy.
Green, J. H.....Troy.
Hartman, S. D.....Tippecanoe City.
Jennings, G.....West Milton.
Kessler, W. H.....West Milton.
Lindenburger, L. M.....Troy.
Sinour, J. G.....Troy.
Smith, S. B.....West Milton.
Sterrett, J. A.....Troy.
Thompson, W. R.....Troy.
Wedener, W. E.....Tippecanoe City.
Wright, T. M.....Troy.

MIAMI VALLEY MEDICAL SOCIETY.

AUXILIARY SINCE 1879.

ANNUAL MEETING IN MAY.

MEMBERS.

Anderson W. S.....Newtonsville.
Anderson, F. M.....Newtonsville.
Andrews, J. H.....Goshen.
Becker, C. M.....Cincinnati.
Belt, R. C.....Milford.
Bishop, L. W., Sr.....Batavia.
Bishop, L. W., Jr.....Batavia.
Bishop, N. W.....Loveland.
Boylan, J. E.....Cincinnati.
Briggs, E.....Cuba.
Carmichael, W. A.....
Cline, J. B.....Perinsville.
Cline, Galen.....Perintown.
Collins, J. B.....Butlerville.
Combes, J. S.....Boston.
Couden, J. F.....Morrow.
Cullen, G. I.....Cincinnati.
Conard, G. R.....New Vienna.
Curry, F. C.....Milford.
Darby, F. H.....Morrow.
Evans, N. P.....Miamiville.
Frost, F. H.....Lebanon.
Graham, W. T.....Lebanon.
Greenlee, W. M.....Waynesville.
Highlands, W. H.....Newtown.
Hough, C. A.....Lebanon.
Johnson, W. A.....Pleasant Plain.
Juettner, A. F.....Cincinnati.
Juettner, Otto.....Cincinnati.
Kennedy, J. C.....Batavia.

Krieger, G. S.....Madisonville.
Macready, J.....Monroe.
Marsh, F. O.....Cincinnati.
Martin, C. J.....Loveland.
Mitchell, T. A.....Boston.
Morris, A.....Goshen.
Moss, W. F.....Mainville.
Mullen, F. J.....New Richmond.
Mounts, J. L.....Morrow.
Murphy, A. D.....Pleasant Plain.
Orr, G. B.....Cincinnati.
Peachley, H. H.....Cincinnati.
Prugh, G. W.....Cincinnati.
Penn, S. W.....Batavia.
Pampell, L.....Madeira.
Quinn, A. T.....Wilmington.
Quinn, T. C.....New Vienna.
Reamy, T. A.....Cincinnati.
Richardson, J. P.....Bantam.
St. John, F. J.....Lebanon.
Sandue, J. L.....Cincinnati.
Scott, Wm.....Loveland.
Scott, J. B.....Loveland.
Scott, W. J.....Norwood.
Scoville, S. S.....Lebanon.
Sellers, A.....Cincinnati.
Shields, E.....Elenor.
Sheppard, W. W.....Wilmington.
Smith, F.....Lebanon.
Stevens, E. B.....Lebanon.
Stevens, E. S.....Cincinnati.
Tafts, C. W.....Hartwell.
Tichenor, E. J.....Lebanon.
Tribbett, C. A.....Westboro.
Trimble, R. T.....New Vienna.
Van Winkle, B. L.....Blanchester.
Van Winkle, N. B.....Blanchester.
Wire, G. W.....Wilmington.

ROSS COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1876.

ANNUAL MEETING IN APRIL.

MEMBERS.

Barnes, T. S.....Chillicothe.
Barnes, J. W.....Hallsville.
Cox, J. M.....South Salem.
Evans, J. M.....Clarksburg.
Evans, T. W.....Richmonddale.
Franklin, G. S.....Chillicothe.
Galbraith, E. J.....Chillicothe.
Hall, W. A.....Chillicothe.
Hughey, W. F.....Yellow Bud.
Lash, J. W.....Chillicothe.
Leslie, J. M.....Chillicothe.
Mathews, J. M.....Clarksburg.
Macklin, F. M.....Adelphi.
McCafferty, C. S.....Chillicothe.
Morgan, J. B. F.....Clarksburg.
Pricer, W. E.....South Salem.
Riley, C. C.....Chillicothe.
Robb, H. H.....Frankfort.
Robbins, G. E.....Bowenville.
Scott, D. H.....Chillicothe.
Willshire, J. M.....Gillespieville.

SANDUSKY COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1880.

ANNUAL MEETING IN DECEMBER.

MEMBERS.

Bowman, D. E.....Kansas Station.
Brinkerhoff, D. H.....Fremont.
Caldwell, Wm.....Fremont.
Campbell, D. D.....Green Spring.
Corey, J. M.....Fremont.
Durbin, R. W.....Fremont.
Erwin, N. B.....Gibsonburg.
Gessner, G. A.....Fremont.
Gessner, L. S. J.....Fremont.
Harnden, C. L.....Clyde.
Lauterman, G.....(Huron) Bellevue.
Pontius, C. R.....Fremont.
Rice, J. B.....Fremont.
Rice, Robert H.....Fremont.
Robinson, L. E.....Clyde.
Shipley, A. D.....Helena.
Smith, G. E.....Fremont.
Stamm, M.....Fremont.
Stillwell, T.....Fremont.
Taylor, S. B.....Fremont.
Thomas, O. H.....Fremont.
Thompson, J. C.....Rollorsville.
Waters, R.....Lake Side.
Wilson, J. W.....Fremont.

STILLWATER MEDICAL SOCIETY.

AUXILIARY SINCE 1873.

ANNUAL MEETING IN JUNE.

ZELLARS, W. A.....President.
COPELAND, D. W.....Secretary.

MEMBERS.

Anderson, B. G.....Tippecanoe.
Black, H. C.....Freeport.
Brannan, T. H.....Canal Dover.
Brown, O. S.....Londonderry.
Copeland, D. W.....Piedmont.
Custer, G. D.....Scio.
Groves, J. E.....Uhrichsville.
Hobson, J. A.....Flushing.
Howell, J. G.....Freeport.
Johnson, J. D.....Cadwallader.
McGavran, S. B.....Cadiz.
McCurdy, S. L.....Dennison.
Moore, E. D.....Moorfield.
Pfouts, D. F.....Freeport.
Price, C. H.....Milnersville.
Pumphrey, R. J.....Flushing.
Rosemond, W. B.....Milnersville.
Snyder, D. J.....Scio.
Wallace, John.....Deersfield.
Webster, J. V.....Flushing.
Welsh, J. M.....Deersville.
Wherry, John.....Deersfield.
Zella, W. A.....Freeport.

TRUMBULL COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1868.

ANNUAL MEETING IN MAY.

RICE, C. M.....President.
BRITTON, W. H.....Vice-President.
HARMON, JULIAN.....Secretary.

MEMBERS.

Atkinson, Milton E.....Cortland.
Britton, W. H.....Brookfield.
Brown, Jas. S.....East Mecca.
Brooks, A. J.....Girard.
Chamberlin, C. G.....Kinsman.
Casper, F.....Niles.
Corey, F. C.....Warren.
Griswold, Elisha.....Sharon (Pa.)
Haine, W. J.....West Farrington.
Hays, R. P.....Vienna.
Harman, Julian.....Warren.
Hunt, Wm. C.....Warren.
Iddings, W......
Jones, Allen.....Kinsman.
Jones, Mrs. Carrie L.....Warren.
King, John I.....Burgh Hill.
Mayhew, Martin.....Courtland.
McMurray, James.....Hubbard.
Moore, E.....Southington.
Moore, L. G.....Kinsman.
Rice, C. M.....Newton Falls.
Rupp, S. M......
Sabin, T. M.....Warren.
Seitch, A. J.....Niles.
Stewart, T. H.....Church Hill.
Stevenson, G. R.....Hubbard.
Thompson, A. W.....Bristolville.
Warde, C. S.....Warren.
Williams, M. L.....Warren.
Woods, L. B.....Warren.

UNION MEDICAL ASSOCIATION OF N. E. OHIO.

AUXILIARY SINCE 1870.

ANNUAL MEETING IN FEBRUARY.

WALKER, A. B.....President.
BAUER, M. M.....1st Vice-President.
UNDERWOOD, E. S.....2d Vice-President.
LEONARD, W. W.....Cor. Secretary.
SISLER, L. E.....Rec. Secretary.
LYMAN, C. N.....Treasurer.

MEMBERS.

Allen, Dudley P.....Cleveland.
Applegate, F. A.....Windon.
Baker, A. R.....Cleveland.
Baker, W. O.....Louisville.
Barnes, W. T.....Fredericksburg.
Barnes, S. P.....Massillon.
Barnes, R. H.....Youngstown.
Bauer, M. M.....Lake P. O.
Bauer, E. J.....Mogodore.
Barrett, J. E.....Wooster.
Baird, R. J.....Creston.
Beach, A. M.....Mineral Ridge.
Blankenhorn, H.....Orrville.
Boyd, J. P.....Akron.
Bowman, D. S.....Akron.
Brashear, B. B.....Cleveland.
Brannan, T. H.....Canal Dover.
Britton, E. E.....Spencer.
Brintnall, A.....Liverpool.
Brant, A. C.....Canton.
Brandenburg, F. S.....Cleveland.
Bye, J. M.....Canton.
Campbell, A. B.....Canal Fulton.

Coyle, H. J.....Canton.
Cassidy, James H.....Sharon.
Chapman, B.....Copley.
Conklin, S. A.....Canton.
Connor, H. E.....Akron.
Conn, Eli.....Akron.
Carnes, U. M.....Canton.
Crawford, Thos. P.....Canton.
Cox, S. S.....Lodi.
Davis, J. D.....Kent.
Disinger, H.....Canal Fulton.
Dickson, J. A.....Youngstown.
Dougherty, J. E.....Canton.
Dougherty, L. E.....Greentown.
Dutton, C. F.....Cleveland.
Ebright, L. S.....Akron.
Evans, C. H.....Canton.
Everhart, N. S.....Wadsworth.
Everett, A. B.....Litchfield.
Eyer, Alvin.....Cleveland.
Flickinger, N.....Industry.
Fisher, H. M.....Akron.
Foltz, A. E.....Akron.
Fouser, A. K.....Akron.
Folks, M. C.....Canton.
Forshay, P. Max.....Cleveland.
Frannfelter, Jas.....Canton.
Furguson, J. W.....Canaan.
Gardner, D. S.....Massillon.
Gibson, R. D.....Youngstown.
Gillette, G. S.....Hinckley.
Greenamyer, P. S.....Smithville.
Harmon, J.....Warren.
Hamblin, R. F.....North Royalton.
Hard, E. G.....Medina.
Harmon, J. D.....Warren.
Herrick, H. J.....Cleveland.
Heddleston, C. A.....Atwater.
Hitchcock, E.....Akron.
Hoover, A.....Akron.
Houston, W. O.....Peninsula.
Hollis, C. W.....Lafayette.
Hough, W. S.....Cuyahoga Falls.

Hudson, J. F.....Canton.
Hudson, S.....Medina.
Hunter, T. S.....Ashland.
Hunter, Thos.....Seville.
Hubbard, R. S.....Bedford.
Humphrey, E.....Akron.
Jakobs, W. C.....Akron.
Jakobs, H. H.....Akron.
Jackson, Thos. W.....Akron.
Jones, F. S.....Medina.
Johnson, T. M.....Canton.
Knowlton, W. A.....Brickville.
Landor, T. H.....Canton.
Lee, J. L.....Akron.
Leonard, W. W.....Akron.
Leonard, C. S.....Ravenna.
Leberman, O. E.....Akron.
Loughead, B. B.....Akron.
Lyman, C. N.....Wadsworth.
McElbright, Thos.....Akron.
McCauley, B. B.....West Salem.
McKean, Wm.....Dundee.
McLean, J. T.....New Philadelphia.
McMillan, D. H.....Orrville.
McConnell, L. G.....Northfield.
March, E. J.....Canton.
Marchand, J. F.....Canton.
Martin, Jas.....Fredricksburg.
Marquis, Thos. B.....New Lisbon.
Marshall, S. A.....Canton.
Miller, T. Clark.....Massillon.
Millikin, B. L.....Cleveland.
Millikin, C. W.....Akron.
Miller, M. F.....Wadsworth.
Moody, M. M.....Chatham.
Morrow, E. P.....Canton.
Morrow, E. O.....Canton.
Montgomery, R. H.....Youngstown.
Morris, C. E.....Akron.
Murray, L. S.....Medina.
Nash, E. K.....Montrose.
Norris, C. E.....Akron.
Pape, S. B.....Canton.

Parker, C. B.....Cleveland.
Parks, Thos. C.....Akron.
Peck, Geo. S.....Youngstown.
Pixley, S.....Akron.
Pontius, H. C.....Louisville.
Pope, F. F. H.....Dalton.
Pope, L. B.....Canton.
Portland, E. O.....Canton.
Phillips, T. H.....Canton.
Price, R. F.....Waynesboro.
Preble, Edward.....Cleveland.
Randall, R.....Bath.
Rabe, J. W.....Akron.
Reed, T. J.....Massillon.
Robinson, J. D.....Wooster.
Roebuck, D. Y.....Dalton.
Robinson, J. N.....Medina.
Rossenwasser, M.....Cleveland.
Ruggles, J. H.....Creston.
Russell, F. P.....Suffield.
Sampson, G. N.....Warren.
Seiler, J. H.....Akron.
Sherman, H. G.....Cleveland.
Scott, X. C.....Cleveland.
Scott, W. J.....Cleveland.
Scott, N. Stone.....Cleveland.
Shelton, S. J.....Navarre.
Sherman, A. M.....Kent.
Sipher, J. N.....Cleveland.
Sarrick, J. W.....Krumroy.
Spencer, E. R.....Dolestown.
Sperry, W.....Tallmadge.
Straight, H. S.....Cleveland.
Stoll, J. H.....Ashland.
Starr, L. G.....Hudson.
Stiele, W. C.....New Berlin.
Sweitzer, L. S.....Akron.
Sisler, Adam.....Mimsitta.
Sisler, L. E.....Clinton.
Smith, W. G.....Ravenna.
Smith, F. D.....Hartsville.
Smith, D. B.....Cleveland.
Taggert, H. D.....Akron.

Taggart, W. M.....Wooster.
Theiss, H. C.....Akron.
Tressell, J. H.....Alliance.
Underwood, E. S.....Akron.
Upson, H. S.....Cleveland.
Vance, R. A .....Cleveland.
Von Klein, C. H.....Cleveland.
Walker, A. B.....Canton.
Waggoner, J.....Ravenna.
Waite, Jas. E.....Lodi.
Wall, J. J.....Mallett Creek.
Waldron, L. P.....Akron.
Welty, A. G.....Spencer.
Welty, Cullen F.....Cleveland.
Whelan, R. E.....Youngstown.
Willy, A. G.....Spencer.
Wise, S. P.....Millersburg.
Wilson, A. C.....Youngstown.
Wirt, W. E.....Cleveland.
Woods, A. T.....Loyal Oak.
Wolfenstein, J.....Cleveland.
Wuchter, Geo. H.....Wadsworth.
Taggart, W. V.....Wooster.
Zeigler, C. R.....Carrollton.
Zimmerman, H. A.....Youngstown.

UNION MEDICAL ASSOCIATION

OF COLUMBIANA AND ADJOINING COUNTIES.

AUXILIARY SINCE 1879.

ANNUAL MEETING IN MAY.

HOOVER, C. M.....President.
FAWCETT, CHAS. L.....Vice-President.
MOOR, WM.....Treasurer.
BARCKHOFF, PAUL E.....Secretary.

MEMBERS.

Albright, G. W.....Columbiana.
Anderson, Jas.....Salem.
Albright, G. W.....East Fairfield.
Barckhoff, Paul E.....Salem.
Ballinger, S. F.....Alliance.
Bailey, M. N.....East Liverpool.
Beach, A. M.....Mineral Ridge.
Bossert, J.....Washingtonville.
Brook, G. W.....Ellsburg.
Brandenburg, F. D.....Cleveland.
Calhoon, John N.....New Lisbon.
Calhoon, Wm. M.....East Liverpool.
Clark, W. R.....East Liverpool.
Cope, A. B.....Winona.
Dales, S. J.....Alliance.
Douglass, J. A.....Columbiana.
Fancett, R. C.....North Jackson.
Farr, M. C.....Wellsburg.
Fawcett, Chas. L.....Salem.
Gilmore, W. N.....West Point.
Grissell, E.....Salem.
Gruwell, G. P.....Alliance.
Hammond, J. R.....Wellsville.
Heck, Stanton.....Salem.

Hoover, C. M.....Alliance.
Hobbs, W. A.....East Liverpool.
Hughes, W. K.....Berlin Center.
Johnston, M.....Alliance.
Johnston, L. L.....Alliance.
King, A. L.....Columbiana.
McGloughlin, J. V.....New Lisbon.
McConnell, S. M.....Wellsville.
McFarland, W. S.....Wellsville.
McCready, S. R.....Leetonia.
Miles, F. T.....Salem.
Miller, D. J.....North Benton.
Mealy, H. M.....Palmyra.
Moore, Wm.....New Lisbon.
Moore, F. P.....New Lisbon.
Nevin, W. C.....New Lisbon.
Orr, Chas.....Salem.
Ogden, C. B.....East Liverpool.
Parke, B. R.....Wellsville.
Roach, J. A.....Alliance.
Schiller, A. W.....Alliance.
Shaffer, H. H.....Alliance.
Steen, W. D.....Salem.
Temple, J. C.....Alliance.
Tressel, J. H.....Alliance.
Yates, John J.....Hanoverton.
Yengling, A. C.....Salem.

WASHINGTON COUNTY MEDICAL SOCIETY.

AUXILIARY SINCE 1886.

ANNUAL MEETING IN MAY.

HARDY, M. V.....President.
BALLARD, C. B.....Vice-President.
MCKIM, F. E.....Secretary and Treasurer.

MEMBERS.

Adair, S. G.....Beverly.
Athey, R. W.....Barlow.
Ballard, C. B.....Belpre.
Blunden, M. G.....Lowell.
Bohl, John, Sr.....Marietta.
Bohl, Jacob.....Marietta.
Buchanan, I. M.....Lowell.
Cotton, J. D.....Marietta.
Coake, E. P.....Athens.
Eddy, C. W.....Marietta.
Flemming, A. C.....Stanleyville.
Flemming, Ellis.....Wingetts Rum.
Frickle, E. H.....Cutter.
Funk, H. H.....Beverly.
Gale, Geo. T.....Newport.
Gale, C. Bernard.....
Gage, R. S.....Qualey.
Hardy, M. V.....Lower Salem.
Hardy, John C.....Lower Salem.
Hardy, James.....Whipple.
Hart, Samuel.....Marietta.
Hart, R. B.....Marietta.
Hadley, Jas.....Heslop.
Hill, E. W.....Cow Run.
Kelley, P. H.....Waterford.
McKim, F. E.....Marietta.

McClure, Jas.....Marietta.
McGee, F. S.....Belpre.
Metcalf, W. H.....Reno.
Morrison, E. B.....Marietta.
Mulhane, John.....Marietta.
Noland, John G.....Gravel Bank.
Payne, Arthur.....Dayton.
Peoples, L. W.....Bartlett.
Reed, G. W.....Columbus.
Reynolds, N. M.....Bartlett.
Skivington, John.....Marietta.
Sparling, F. R.....Gasville.
Taylor, J. R.....Archer's Ford.
Templeton, B. F.....Zanesville.
Templeton, A. M.....Zanesville.
Ward, J. W.....Archer's Ford.
Warren, C. W.....Newport.
West, W. L.....Matamoras.
Warren, L. E.....Marietta.
Williams, J. H.....Macksburg.
Willis, O. M.....Marietta.

NON-RESIDENT PERMANENT MEMBERS.

Campbell, W. A., Colorado Springs, Col.....1888
Koogler, M. A., Eldorado, Kansas.....1884
Ludington, H., Omaha, Neb.....1871
Martin, G., Adrain, Mich.....1877

HONORARY AND CORRESPONDING MEMBERS.

Professor Ferdinand Hebra, Vienna, Austria.
Professor Isidor Neumann, Vienna, Austria.
Professor Herman Wiederhofer, Vienna, Austria.
Professor Carl Sigmund, Vienna, Austria.
Professor Herman Zeissl, Vienna, Austria.
Professor Ed. C. Seaton, Medieal Inspector of the Privy Council, London, England.
Professor M. Jules Guerin, Member Imperial Academy of Medicine, Paris, France.

HONORARY MEMBERS.

Awl, W. M., Columbus....1872
Bailey, M. J., New York City....1852
Baron, P., Ravenna....1870
Bartholow, Roberts, Philadelphia, Pa....1879
Beeman, P., Sidney....1872
Blackburn, J. C., Covington, Ky....1857
Boerstler, G. W., Lancaster....1865
Brodie, William, Detroit, Mich....1875
Brower, J. H., Lawrenceburg, Ind....1854
Childs, H. H., Pittsfield, Mass....1848
Conant, H., Maumee....1874
Dalton, N., Mineral Point, Wis....1871
Gundy, Richard, Cantonsville, Md....1879
Guthrie, C. B., New York City....1849
Harding, M. H., Lawrenceburg, Ind....1854
Haughton, R. E., Richmond, Ind....1863
Hayes, I. I., Philadelphia, Pa....1857
Hempstead, G. S. B., Portsmouth....1872
Hibberd, James F., Richmond, Ind....1871
Hill, E. L., Oxford....1856
Hunt, S. P., Richmond, Ind....1866
Jenks, E. W., Detroit, Mich....1875
Kerr, John, Canton, China....1875
Kirtland, Jared P., Cleveland....1874
Kitchen, J. M., Indianapolis, Ind....1866
Knight, J., New Haven, Conn....1849
Lee, Charles A., New York City....1848
Lyons, W. B., Huntington, Ind....1866
McIlvaine, R. R., New York City....1871
Moe, L. W., Ottawa....1876
Mussey, R. D., Cincinnati....1865
Noyes, J. F., Detroit, Mich....1875
Parker, Willard, New York City....1852
Safford, E. D., Parkersburg, W. Va....1870

Senn, N., Chicago, Ill.....1890
Steele, H. K., Denver, Col.....1872
Stevenson, J. M., Pittsburg, Pa.....1866
Sutton, George, Aurora, Ind.....1854
Sutton, R. S., Pittsburg, Pa.....1884
Thompson, Robert, Columbus.....1865
Trevitt, William, Columbus.....1858
Tully, William, New Haven, Conn.....1849
Vaughan, Victor C., Ann Arbor, Mich.....1889

CONSTITUTION AND BY-LAWS

OF THE

OHIO STATE MEDICAL SOCIETY.

ADOPTED AT COLUMBUS, OHIO, JUNE 14, 1882.

ARTICLE I.

Title of the Society.

The name of this Association shall be "THE OHIO STATE MEDICAL SOCIETY."

ARTICLE II.

Objects of the Society.

The objects of this Society shall be the advancement of medical knowledge; the elevation of professional character; the protection of the professional interests of its members; the extension of the bounds of medical science; and the promotion of all measures adapted to the relief of the suffering, the improvement of the health, and the protection of the lives of the community.

ARTICLE III.

Members of the Society.

SECTION 1. The Society shall consist of delegates, permanent members, and honorary members.

SEC. 2. Delegates shall receive their appointment from the county, or other local societies: *Provided*, however, that the officers of these societies and the Chairmen of all committees who have reports to present, shall be delegates *ex-officio*.

SEC. 3. Delegates from other States and foreign societies, before admission to a seat in this Society, shall produce a certificate of delegation, signed by the President or Secretary of their society.

SEC. 4. Delegates from auxiliary societies, before admission to a seat in this Society, shall produce a certificate of delegation, signed by the President or Secretary of their society, and shall, after having complied with the requirements or provisions of Sec. 5, Art. III, become permanent members of the Society.

SEC. 5. Permanent members shall be regular practitioners of medicine in the State of Ohio, shall be graduates of a medical college in good standing, shall be members of a county or district society where they reside, and their election shall require a majority vote at a regular meeting, their eligibility having been previously reported upon favorably by the Committee on Admissions. Every applicant for permanent membership shall deposit with the Treasurer the sum of $3.00 as a membership fee, and also the dues for the current year (which sums shall be returned to him if his application is rejected). Permanent members alone shall transact the legislative business of the Society. Permanent members who may remove from this State shall, upon their request, be styled Non-resident Permanent Members, and shall, without the payment of dues, be entitled to all the rights and privileges of honorary members. Non-payment of dues for three years shall work a forfeiture of membership.

SEC. 6. The Society may elect eminent physicians as honorary members. Those elected in any year shall not exceed six.

SEC. 7. Honorary members and invited guests shall have the privileges of a seat at the meetings, of presenting papers, and of taking part in the discussions, but they shall not vote on any question, nor be eligible to any office. Papers read by them require a special vote, by the Society, of reference to the Committee on Publication, in order to appear in the published transactions.

SEC. 8. The names of all permanent members in good standing, and of all honorary members, shall be published annually in the Transactions.

SEC. 9 [Adopted 1889.] Any member of thirty years' standing, who has paid dues continuously, shall be declared a permanent member without further payment of dues.

SEC. 10. [Adopted 1891.] All members in good standing in county and district medical societies shall be permanent members of this Society, and shall be entitled to all its rights and privileges, including a copy of the annual "Transactions," excepting that the business of the session shall be transacted by delegate members: *provided*, that all members of the Society up to the present date shall be entitled to vote.

ARTICLE IV.

Auxiliary Societies.

SECTION 1. Any county or other local medical society, whose constitution embraces the objects of this constitution, and the Code of Ethics of the American Medical Association, may, upon application, become auxiliary to this Society, and shall be entitled to one delegate for every five members, and one for every additional fraction of more than half that number.

SEC. 2. Every auxiliary society shall enforce the observance by its members of the Code of Ethics adopted by this Society; and shall be authorized to censure, suspend, or expel any member convicted of violating its provisions.

SEC. 3. Any member of an auxiliary Society who shall feel aggrieved at the action of such Society in enforcing discipline among the members, shall have a right to appeal to this Society.

SEC. 4. The Secretary of each auxiliary society, not less than one month preceding each annual meeting of this Society, shall make a full and correct catalogue, with post-office address, of its officers and members in good standing at that time, together with a certified list of its delegates, and transmit the same at once to the Secretary of this Society. If the name of a member is omitted from this catalogue that was contained in the last preceding catalogue, the Secretary must explain the omission by stating whether the member, whose name is omitted, is dead, has withdrawn, has removed, been expelled, or suspended. Any auxiliary society that fails to comply with this requirement shall be held to be in contempt, and none of its members shall be allowed to participate in the business of this Society, or be entitled to any of its rights or privileges, until such society shall have purged itself of the contempt.

SEC. 5. In case of the death of any of its members, who are also members of this Society, it shall be the duty of the Secretary of each auxiliary society to transmit to the Secretary of this Society a suitable obituary notice for publication.

ARTICLE V.

Officers.

SECTION 1. The officers of this Society shall be a President, four Vice-Presidents, Secretary, Assistant Secretary, and a Treasurer and Librarian.

SEC. 2. The officers shall be elected by a ballot vote of a majority of all the members present, shall enter upon their duties at the close of the meeting at which they were elected, and shall serve one year, or until their successors are elected.

SEC. 3. All vacancies in office, occurring in the interim of the meetings, shall be filled by appointment of the President.

ARTICLE VI.

Duties of Officers.

SECTION 1. The President shall preside over the meetings, preserve order, call meetings when in his judgment the interest of the Society may require, deliver an address and perform such other duties as custom and parliamentary usage may require.

SEC. 2. The Vice-Presidents shall assist the President in the performance of his duties, and, in his absence, preside over the meetings, in the order of their seniority.

SEC. 3. The Secretary shall keep correct minutes of the proceedings of the Society, and prepare and furnish the same to the Committee on Publication for publication in the Transactions, notify committees and Society delegates of their appointment, take charge of all manuscripts, papers, etc., read at the various meetings, and transfer the same to the Committee on Publication for publication; give due notice of the annual meetings, conduct all business correspondence, give official notice to all auxiliary Societies of resolutions, etc., passed by this Society that have reference to the said societies, and also notify them of the time for making their reports to this Society, and perform all other duties which common usage of other corporate or organized bodies may require. His salary shall be $125 per annum.

SEC. 4. The Assistant Secretary shall assist the Secretary in the performance of his duties as the latter may require, and act for him in his absence. His traveling and hotel expenses shall be borne by the Society.

SEC. 5. The Treasurer and Librarian shall receive all moneys due the Society, pay all bills countersigned by the Secretary, keep a correct, itemized account of all receipts

and expenditures, with all vouchers, and make a full report of the same at each annual meeting. He shall have charge of all the books, manuscripts (not especially belonging to the Secretary), instruments, specimens, preparations, and other scientific property belonging to the society, keeping a complete catalogue of the same, and report the condition of this department at the annual meeting. He shall give bond for the faithful performance of his duties in the sum of twice the amount of money in his posesssion, with two sureties, said bond to be deposited with the Secretary. His salary shall be $125 per annum.

SEC. 6. The officers shall deliver all records, books, funds and other property belonging to their several offices, to their successors, when the latter shall enter upon the discharge of their respective duties.

ARTICLE VII.

Committees.

The Committees of this society shall be Standing and Temporary. Standing Committees are those whose duties continue from year to year. They shall each consist of five members, and, unless otherwise specified, shall be elected by the Society, one member being elected each year, except the first year, when one member shall be elected for five years, one for four, one for three, one for two, and one for one year. The Standing Committees shall be: Committees on Arrangements, Finance, Admissions and Medical Societies, Ethics, Publication, and Medical Legislation. Temporary Committees are those whose functions cease with the meeting at which they are appointed. They shall be appointed by the President, as the necessity for their existence arises.

ARTICLE VIII.

Standing Committees, and their Duties.

SECTION 1. The Committee on Arrangements shall, if no sufficient reason prevent, be mainly composed of mem-

bers at the place where the next annual meeting is to be held. It shall provide suitable rooms and accommodations for the meeting, and, in all matters not otherwise provided for, superintend and protect the general interests of the Society. This Committee shall be appointed annually by the President.

SEC. 2. The Committee on Finance shall superintend the monetary affairs of the Society, inspect and audit all bills and accounts of the Treasurer, examine and determine the amount, and make such assessment, by a *pro rata* tax upon the permanent members, as may be necessary for incidental expenses, and perform such other duties as may devolve upon it.

SEC. 3. The Committee on Admissions and Medical Societies shall examine and pass upon the qualifications of delegates, and the applications for admission of auxiliary Societies, and perform such other duties as may devolve upon it.

SEC. 4. The Committee on Ethics shall examine and report, for the action of the Society, all cases of appeal from the auxiliary Societies, and such other matters as may be referred to it by the Society. If any member shall be charged, in writing, with any violation of the provisions of this Constitution and By-Laws, or with unprofessional conduct, a copy of such charge shall be furnished to him by the Secretary, and himself and accuser cited to appear, when the Committee shall proceed to hear the case, reserving its decision to be reported to the society; except, that any case may be referred to an auxiliary society for adjudication, and from the decision of the auxiliary Society an appeal may be carried to this Society. Reports from this Committee, when unanimous, shall be acted upon without debate.

SEC. 5. The Committee on Publication, of which the President and Secretary shall be members *ex-officio*, shall examine all papers presented to the Society, and have printed in the Transactions such as it deems worthy of publication.

SEC. 6. The Committee on Legislation shall watch the course of State legislation on medical subjects, and take charge of such matters as shall be referred to it by the society. All proposed legislation offered by any member of this Society, and all resolutions touching medical legislation, shall be referred to this committee, which shall make a report thereon to this Society as soon as possible. It shall also, at each annual meeting, report to the Society any laws relating to medical matters that may have been passed within the year.

SEC. 7. The Standing Committees shall keep regular minutes of their proceedings, and furnish an authenticated copy thereof, to be deposited with the Librarian.

ARTICLE IX.

Delegates.

SECTION 1. The Delegates appointed by this society to the American Medical Association or to other societies, shall report briefly, in writing, through their Chairman, such items of general interest as may have claimed the attention of the bodies to which they were respectively delegated.

ARTICLE X.

Meetings.

SECTION 1. The meetings of this society shall be annual, and shall occur at such time and place as the Society may appoint: *Provided*, that special meetings may be called at any time by the President, and shall be so called by him on the written request of twenty-five members. Due notice of all the meetings shall be given by the Secretary, and in case of a special meeting the object for calling said meeting shall be distinctly set forth in the notice.

SEC. 2. Fifteen permanent members shall constitute a quorum for the transaction of business.

ARTICLE XI.

Code of Ethics.

The Society adopts, as a part of its regulations, the Code of Ethics of the American Medical Association.

ARTICLE XII.

Amendments.

Every proposal for amending the Constitution shall be made in writing; and, if such amendment receive a majority of four-fifths of the permanent members present, it shall be adopted; but otherwise, the amendment shall lie over until the next meeting, when it may be adopted by a majority of two-thirds of the permanent members present.

ARTICLE XIII.

Nothing in this Constitution shall be so construed as to deprive any one now a member of this Society of any rights or privileges held by him before the adoption of this Constitution, unless voluntarily surrendered by him.

BY-LAWS

I.

Order of Business.

1. The President, or, in his absence, one of the Vice-Presidents, shall call to order; or, in case of the absence of all these officers, a chairman shall be appointed *pro tempore.*

2. Reading of minutes. Report of the Committee of Arrangements (on first day).

3. President's address (afternoon of second day).

4. Election of officers (afternoon of second day).

5. Selection of a place for the next meeting (afternoon of second day).

6. Business which requires early consideration.

7. Reports of Standing Committees.

8. Reports from delegates to the American Medical Association, and other societies.

9. Written communications on medical subjects (papers).

10. Oral communications.

11. New business.

12. Unfinished and miscellaneous business.

13. Adjournment.

II.

In filling blanks, the longest time and the largest sum shall be first put.

III.

Any three permanent members may call for the ayes and noes.

IV.

All questions of order, not especially provided for, shall be decided according to Cushing's Manual of Parliamentary Practice.

V.

Not to exceed twenty minutes shall be allowed for the reading of any paper.

VI.

No paper shall occupy over thirty pages of the Transactions.

VII.

All reports, papers, and addresses presented to this Society by its members are the property of the Society, and shall be referred, without motion and without recommendation, to the appropriate committee; and it shall be considered a misdemeanor for the author of any such report or paper to permit the same to be published, except as authorized by special vote of the committee, or the Society.

VIII.

No speaker shall be allowed to speak a second time on the same subject, without the consent of the Society.

IX.

The time allowed each speaker shall not exceed ten minutes, except by general consent.

X.

The motion to adjourn, to lie on the table, or for the previous question, shall be decided without debate.

XI.

The motion for the previous question, if decided in the negative, shall have no effect on the main question.

XII.

Any of these by-laws may be suspended at any time by a three-fourths vote of the permanent members present. Every proposed amendment must be offered in writing; if it receive a four-fifths vote of the permanent members present, it shall be adopted; otherwise it shall lie over until the next meeting, when it may be adopted by a majority of two-thirds of the permanent members present.

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